



MOTHER AND CHILD.

PART I.

MOTHER.

BY

EDWARD P. DAVIS, A.M., M.D.

PART II.

CHILD.

BY

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PREFACE.

We have endeavored to make this manual both instructive and readable. Our aim has been, not to supplant the physician, but to supplement his advice and render intelligible those matters that mothers and nurses find difficult to understand. Although our own views are definite and positive, as the result of large experience, we recognize that the experience of others causes them to differ in many points of detail and management, and in order to make our book cover as large a field as possible, we have added much material from the writings of other physicians whose opinions have great weight and whose advice is of incalculable value. Frequently a change of diet from a well-recognized formula to one possibly, in theory not so good, is most important for the child, and on that account we have endeavored to incorporate all the suggestions that experience has shown to be of value, at the risk of being prolix, that a choice may be made to suit each individual case. There are undoubtedly times when a competent physician is not obtainable, also there are emergencies when something has to be done at once, and consultation with books becomes a necessity; under such circumstances we hope that our little work will prove useful. Then, again, frequently the physician has not the time to instruct his patient in all the

little details of treatment, nor can he answer in a few words the many questions put to him; we have tried to anticipate this, and to place in his hands a manual that, instead of encroaching upon his prescriptions, will, on the contrary, aid him by instructing the mother and care-taker,—not sufficiently to make them inferior doctors, but enough to make them intelligent patients and skilful nurses.

In order to more thoroughly individualize each part, it was thought advisable to adopt the plan here presented; but each author carefully revised the proofs of the whole book, and the views and recommendations are endorsed by both.

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CHAPTER I.

GIRLHOOD.

It has been truly said that "the boy is father of the man," and it is not less true that the girl is mother of the woman. The foundations then for sound and healthy womanhood must be laid in girlhood, and the system thus begun must be continued faithfully, yet with wise moderation, if it is to be of permanent usefulness. No subject is of greater importance in this connection than the hygiene of the girl's life. For the first ten or twelve years, her capacity for physical exertion and endurance is practically that of a boy of the same age. Although naturally inferior in muscular development later in life, during these first years she should be fully his equal in strength, endurance, and dexterity. At this time tastes should be encouraged and habits formed which may eventually prove most important in the maintenance of health. Girls should be allowed to become interested in out-door sports during the first ten or twelve years of life, and habits of out-door exercise should be fostered in every way. This plan must of course often be modified to suit individual cases, and excess of exercise is to be deprecated. Parents and teachers should watch children carefully to see that lasting injury is not done to the latter by over exertion. Tennis is a game that lends itself admirably to the vigorous and healthful use of the muscles, but what benefit can possibly come to a girl of twelve who plays so many sets that she finally drops fainting on the grass? Emulation and the desire not to spoil the game for

the companions who depended on her to complete the necessary number of players, was the motive for this fortitude, but her young friends could better bear to be disappointed once than she could to injure herself physically for life.

A love for animals, which is not uncommon in childhood, may be advantageously encouraged, and often gives increased zest to open-air enjoyments. When possible, a girl should be taught at the earliest opportunity to ride and drive. Skating, running, jumping, and climbing are quite appropriate exercises for girls of this age, while there can be no better time to perfect the art of swimming than in the years from eight to twelve. The girl then knows little fear of the water, and swims readily, whereas later in life timidity often prevents the acquirement of such knowledge. She can be taught even at this early period to save a life in danger from drowning, and such instruction has not infrequently borne fruit in succeeding years. The writer recalls two women who learned to swim in early girlhood, each of whom has saved lives by ability in this accomplishment, and one of whom has been honored by a medal from a Humane Society. There has also been great harm done, however, to girls by *immoderate* exertion in gymnasium and swimming-school, especially in jumping from a height of many feet into the water beneath, and it must therefore be remembered that it is the "use, and not the abuse," of these aids to physical development that makes the healthy girl and woman.

There can be no objection to teaching the girl the use of the rifle and shot-gun, and giving her a taste for hunting and fishing, and many a husband has been delighted to find his wife capable of sharing in his sports by reason of an education given in her girlhood. The idea that it is hoidenish for a girl to practise physical exercise and enjoy out-door sports is one of the prudish superstitions which has done much to retard the physical development of American women. A knowledge of the use of fire-arms is also of decided value to a girl in enabling her to be calm and courageous under various con-

ditions of threatening danger. The tortures suffered by many girls and women in the thought of a possible attack by burglars would probably disappear, certainly be much lessened, by the assurance of possessing the power of self-defence. America might not be now the land "of the free and the brave" if the "women of the first century" (unlike their sisters of a later date) had not cultivated the use of weapons, and nerved themselves to feats of personal heroism in order to resist the onset of treacherous or desperate Indians. There is no fear that the pursuit of such qualifications will detract from the gentleness and delicacy of feeling which should characterize girlhood, for it is a well-known fact that the pioneer women just alluded to were as remarkable for feminine charms as for the undaunted bravery which was formerly thought the distinctive mark of the stronger sex.

The domestic nature of the girl rarely needs stimulus; she is usually willing to learn to sew, and to acquire familiarity with the household arts essential to a truly useful woman. Many children exhibit also a decided taste for music or drawing; if an ability for the latter is manifest, the child will enjoy reproducing to the best of her power some favorite bit of scenery, or the head of a pet animal, and thus a knowledge of out-door life will directly foster an artistic instinct. Too much importance can scarcely be laid upon the out-door element in the girl's life, for there can be no more potent factor in laying the foundations for healthy womanhood than the vigor attained through out-door exercise.

The dress of the girl should be adapted to permit the freest possible movement; she should be supplied with thick-soled, low-heeled shoes, well fitting, but sufficiently large to encourage walking and running. Fashion should be subservient entirely to health, comfort, and encouragement of exercise. The nutrition of a child so educated will require little attention beyond the furnishing of an ample supply of thoroughly nutritious food, but this point of properly nourishing growing girls needs much more care and thought than the average American

mother seems inclined to bestow upon it. The nervous waste occasioned by constant exercise must be repaired by abundant and wholesome food, if the girl is to develop into a thoroughly healthy personality. Ten hours of sleep should be the rule, and sponge-bathing in either warm or cold water should be practised daily. It is well known among athletes that exercise and cold sponging produce a marvellously clear complexion, and as the foundation of woman's beauty is laid in girlhood, a hint may be taken from athletes in this respect. Complete sponging, followed by energetic rubbing with the rough towel, produces a delightful feeling of exhilaration, and is succeeded by improved circulation.

The girl should be carefully guarded from stimulants and narcotics in every form. Neither tea, coffee, nor alcohol should be given, nor should opium or other narcotics be administered for trivial ailments unless by the direct prescription of the physician. An excessive use of tea in this country is doing much to weaken the nerves of women, and is an evil tendency that may lead to serious consequences in producing permanent feebleness of constitution. A morbid appetite for candy, pickles, and other abnormal articles of food should be promptly suppressed in girls, and the helpful effects of really nutritious articles carefully explained, as these vagaries of appetite often arise from thoughtless ignorance of the laws of health and strength.

The mental education of the girl should not be made a matter of routine memorizing; the child should learn to read, to write, and to count, but beyond this it is quite unnecessary to go until young womanhood is attained. An education, however, of the best sort is to be gained during this period by observation of the external world, and by the conversation and example of older persons with whom the child is thrown. How often a girl of twelve or thirteen accompanies her parents through Europe, and instead of using her eyes and brain, while travelling in the railway carriage, to note the interesting and novel objects around her, is buried deep in a romantic tale, use-

ful and entertaining in its proper season, but not to be compared in its educational power, at such a time, with the developing force of observation of nature and human character! While habits of regularity can be formed by certain definite times for study, yet application to books in-doors should never exceed a half-hour at any time. If the girl is to grow to womanhood with sound eyes and healthy nerves, she should not be obliged to apply herself assiduously to books in-doors. These statements may seem to the reader dogmatic and extreme, but they are founded upon the observation of women suffering from physical imperfections which began during the period of girlhood. It would probably be difficult to find a school, college, or institution of instruction for girls anywhere, in this country, which is based upon this plan of study of books at school and dispensing of books at home; but if such a system were to be adopted, there is little doubt that there would result a vast improvement in the health of the American girl. When it is remembered that without individual vigor, a knowledge of all the sciences that exist will be of very slight value in rendering a woman happy and useful, it seems as if it might be worth while to sacrifice an acquaintance with Greek and trigonometry if the girl by such study is losing the opportunity of cultivating physical strength and endurance.

The life of the healthy girl is an exceedingly happy one; she finds no better friend or companion than kind parents or a congenial brother: prudery and tradition have not yet taught her that she is to be hedged about with many restrictions upon her taste and ambitions, and the happiest days of life in mind and body are often passed at this period.

CHAPTER II.

THE PERIOD OF PUBERTY.

THE development of the girl to womanhood exposes her to dangers which demand careful consideration. If it be remembered that the normal performance of the function of menstruation is almost directly dependent upon the general physical development of the woman, it will be seen that the hygiene of girlhood is the best preparation for healthy womanhood. The establishment of the functions of womanhood occurs at different ages, varying with the climate in which the girl lives and her individual peculiarities of temperament. If a warm climate and an out-door life have predisposed to early performance of physical functions, this may be established in the twelfth or thirteenth year; on the contrary, if climatic influences are adverse, if the individual be naturally slow in maturing, and if those influences which stimulate unduly the nervous system be kept from the girl, the establishment of menstruation will occur as late as the fourteenth year or subsequently. As a preparation for this important function, all extra strain upon the nervous system should be assiduously avoided in this climate after the years of twelve and thirteen. The girl need not be told the reason for this, except, in a general way, that she is growing older, and ought not to do as she has done three years previous. It is her mother's duty, however, to see to it that at this time she leads as tranquil and healthy a life as possible, in which the emotional nature is little disturbed, while abundant sleep, fresh air, and freedom from nervous strain are jealously secured for her. If the girl loses appetite and seems generally depressed, a physician should be consulted; he may discover some poverty of blood, or deficiency in general vigor, which may be easily remedied by an appropriate tonic. It is most unwise, however, for mothers to select at random

one of the many patent medicines advertised in the market as specifics in this condition; it should also be remembered that menstruation is rarely established with regularity for several months after its first appearance. A period of six months or a year is often observed before this function is performed at regular periods. Irregularity, then, at first need occasion no alarm provided the general health remains good. When the first symptoms of menstruation appear, especial caution should be exercised that the girl's clothing be warm, loose, and comfortable. The administration of a simple laxative is often of value, while the use of the hot mustard foot-bath, absolute rest in a warm bed, the application of warm cloths to the abdomen, and the moderate use of hot but not stimulating drinks, have been often found of value. Although alcoholic liquors, either gin, rum, whiskey, or brandy, are often taken by adults to relieve distress at this time, yet the mother will do well to avoid these stimulants in caring for her daughters; a taste for alcohol is too easily formed to render it safe to administer these substances to secure the performance of a natural function. There is no drug or medicine which a mother may safely give to her child at this time without the advice of a physician. Those nostrums in the market which are potent for good owe their value to some familiar drug which should be prescribed by a physician only: the vast majority of these medicines are inert, and of no value whatever. It is most important that absolute rest be enjoined during the first day or days of this period while it is about to be established. and the neglect of this simple precaution has often resulted in exposure, and in laying the foundations of lasting disease. The wetting of the feet, sitting in damp clothing, and the incurring of great fatigue at this season. are perils which, if thoroughly understood, would be shunned as serious dangers. Circumstances point plainly to this period in the life of the woman as a time in which she is poorly fitted to assume active duties. The girl loses the freedom of motion and the careless good health of happy childhood: she becomes easily embarrassed,

awkward in action, and often shy in disposition. At the same time, new matters and ideas are developing in the mind, and need wise guidance into proper channels. At this period the girl should have the best and wisest nurses: one of those is her mother, the other is Nature, or the world about her. As the flowers mature best under the influence of the quiet forces of sunshine and moisture, so the physical and mental being is best unfolded to the stimulus of a simple life and the companionship of maternal affection. No more injurious course of action can be taken than to urge a girl at this period to enter general society, to apply herself assiduously in any occupation or study which taxes the nervous system, or to indulge in those romances which often end in laying the foundations for future sorrow, if the girl be not protected by those wiser than she. It is a false and foolish parental ambition or indifference which refuses to listen to the growing girl's complaint of lassitude and disinclination to exertion at this time; this is not the period when such desires are the result of hypochondriasis or indolence; but the disposition to avoid great exertion and to husband the strength as much as possible is natural and right. Such tendencies should be met by careful scrutiny and a sympathetic, intelligent apprehension of the needs of the individual. While there are many boarding-schools which are presided over by wise teachers and guardians, it is far better for the girl at this time if she can be under the tranquillizing influences of a congenial home; class rules which cannot be infringed upon for the sake of any one pupil (unless she be wholly incapacitated) often oblige her to undergo more exertion than she is physically qualified to meet; neither does she always receive the right kind of nourishment, nor has the teacher time to note and remedy a failure of appetite or vigor.

CHAPTER III.

THE HYGIENE OF WOMANHOOD.

In the climate of the United States, and under average circumstances, womanhood may be said to begin at from eighteen to twenty years of age. If her previous years have been spent in surroundings calculated to secure good health, the girl will find herself possessed of strength sufficient not only for the ordinary domestic duties of life, but, should necessity demand it, to engage in some occupation for her livelihood. No matter whether she is obliged to maintain herself, or whether her ambition leads her into the arduous idleness of fashion, if the health and strength are to be preserved, the same precautions must continue which were enjoined during childhood. The clothing should remain well fitting, loose, and comfortable. Corsets should be left to those more ignorant and stupid than herself, and habits of exercise out of doors, the use of nutritious and easily-digested food, and the securing of a sufficient supply of sleep are still of vital importance. The most successful women understand perfectly the need for constant care in the preservation of health and beauty. The popularity of massage, the increased number of attractive health resorts, and the wide-spread interest in out-door athletics for women, as well as physical culture in-doors during the winter, give ample evidence of this fact. The additional suppleness, grace of movement, and elasticity of the whole body, attained by conscientious practise of the physical culture exercises, prove a more than sufficient reward for the time and energy bestowed upon them.

An opportunity is given in the early spring, with the sanction of the church, to avoid overtaxing in the loss of sleep and bad eating which the fashionable season imposes. The great desire to possess homes in the country, in addition to

city houses, has resulted in shortening the period of city life, so that, at the present time, many live in town but a third of the entire year. This is a distinct gain in the health and comfort of those who are fortunately able to follow this custom.

Among those who are obliged to work for a livelihood, suitable materials for proper clothing can be obtained at lower prices than formerly, and light woollen stuffs, which are so essential to health, are far more available than in former times. Food is better cooked in the average boarding-house and restaurant, to which women have access, than was the case ten or twenty years ago. A greater variety is afforded for a moderate price, and the maintenance of a fair condition of nutrition is thus within the reach of nearly all.

Very few workers in any pursuit are unable to obtain a summer holiday, however brief. Women are now offered lodgings, food, and care in various homes and hotels maintained for working-women, which give them the conditions necessary for health at the lowest possible prices. The heating and ventilation of shops and factories are better than formerly (although there is much still to be desired in this respect), and the use of machinery, of elevators, and other labor-saving devices, has reduced some injurious forms of muscular exertion very greatly.

The increased opportunities for practising stenography and type-writing have given women an occupation which, under favorable circumstances, is not hurtful to those of average strength.

Training-schools for nurses offer a safe, honorable, and lucrative employment, for which women are especially well fitted, to those of good constitution and sound nervous system. No others can become successful nurses, but such can derive good incomes, and if they possess sufficient education and executive ability, can secure, as superintendents of schools and hospitals, those medical positions for which women are best adapted.

When American civilization advances sufficiently to furnish a class of properly-trained women for house service, one of

the most puzzling problems in securing healthy occupations for women will be solved. At present, the young woman coming to the city often prefers to stand behind a counter, adorned with cheap jewelry, as a "saleslady," when she could earn more money at less expense to herself and under conditions favorable to health as a trained waitress, child's nurse, seamstress, or maid. American democracy has placed these pursuits in an unfavorable light in the minds of women, and they are regarded as menial and undignified. A change in this can of course result but gradually, but when it shall come, the lives and health of many women will be preserved, which are now injured or lost by the disadvantageous surroundings found in many large shops and factories.

CHAPTER IV.

CONCEPTION.

The conditions influencing conception are so many and so different that a brief consideration of them can hardly fail to be of interest. It has been asserted by some authorities that conception occurs more frequently in the months of spring than in midsummer or midwinter. Next in frequency the autumnal months are given. It is well known that the general condition of a nation as regards plenty or famine, prosperity or adversity, war or peace, freedom from excessive labor or necessity for toil, influences in a very marked degree the increase of population. In a general way climate also has something to do with the growth of the human family. The portions of the globe where man survives under the greatest difficulties by reason of the severity of heat or cold show, as a rule, less flourishing families than the more temperate regions. Regarding the age at which conception is possible, we find that it varies from the period of puberty to several months

and, in some rare cases, several years after the cessation of menstruation. Conception often occurs about the "change of life."

So far as age in years is concerned, this changes in different races and different climates, but the fact is familiar that in the tropics women bear children earlier and cease reproduction sooner than in temperate or cold climates. So far as the conditions favoring conception in individual cases are concerned, the many circumstances which make up the life of the wife have considerable influence. The years of greatest fecundity, when reproduction is least injurious to the woman and when children are born best developed, are between the years of twenty and thirty. Great unhappiness, severe nervous shock, prolonged ill health, and, in general, any excessively depressing and persistently acting influence may result in the suspension of the reproductive function. So far as the estimation of the time between the periods of menstruation when conception is most likely to occur, the former belief has been that immediately after the cessation of the monthly period liability was greatest.

More recent investigations have led us to believe that the four weeks or thirty days between the menstrual epochs may be divided into three periods of ten days each. During the first ten days after menstruation and during the ten days immediately preceding the next period, liability to conception is greatest. In the ten days between these periods, liability is less. Exceptions, however, to all rules and estimates, and to all methods of computation, are so frequent that no fixed rule can be given, and it must be understood that liability is always present, whatever may be the time, during the inter-menstrual period.

CHAPTER V.

SYMPTOMS OF PREGNANCY.

THE symptoms of pregnancy are naturally divided into the presumptive and the positive. The most frequent presumptive symptom is cessation of menstruation, and yet, when we consider the many causes which may disturb the regular course of this function, it can readily be seen that this is far from being a positive symptom, and is, in fact, only the most commonly-observed presumptive symptom. Any unusual strain upon the vital powers, change of climate and residence, exposure to cold or to extreme heat, the disturbances incident to marriage, and, in general, any great depression of the woman's physical economy, or any sudden change in her environment, may result in the temporary suspension of menstruation. This may persist for several months without serious disease being present, and as the general balance of the economy is restored, so the function becomes re-established. Other presumptive symptoms of pregnancy are a sensation of weight and fulness in the abdomen, enlargement of the breasts, with tenderness about the nipples, marked variation in the appetite, with desires for unusual sorts of food, all intensified by a strong desire for, and belief in, the occurrence of pregnancy.

In rare cases, abdominal enlargement may even proceed to the size attained at the end of normal pregnancy, and still pregnancy may not exist. While too much stress should not be laid upon the presumptive symptoms of pregnancy, yet disturbance of menstruation and variation in the general health should arouse the woman's suspicions, and should lead her to consult her physician at once. He may be able to detect some temporary disorder which treatment may remedy, or his experienced scrutiny may determine the existence of pregnancy. So soon as presumptive evidence of pregnancy is

observed, the woman should avoid fatigue and extremes of every sort, and maintain the best possible general condition of health until her condition can be definitely ascertained.

The positive symptoms of pregnancy are present when the child is sufficiently advanced so that its existence can be appreciated by the physician by the senses of hearing, of touch, or of sight. By these we mean that when the physician can hear the heart-beat of the child within the womb; when by placing his hand upon the abdomen he can feel distinctly the movements of the child, and by watching closely the surface of the abdomen as the mother is resting quietly in a recumbent position, can observe slight movements which are occasioned by the motions of the child's limbs within the womb, then the positive existence of pregnancy is established beyond doubt. Ordinarily, however, it is quite sufficient for the physician to hear the beating of the child's heart, and this can usually be done soon after the fourth month of the child's existence. In repeated pregnancies, the mother can often from experience assert positively regarding her condition; but even the sensations of an experienced mother are occasionally at fault, and so a positive verdict must be deferred until the physician can demonstrate the existence of the child.

CHAPTER VI.

DURATION OF PREGNANCY.

It is well to define the terms used to express the premature birth of the child, and also the limits to the time in which a child may be born and survive. By the word *viability* we understand the child's ability to survive when expelled from the womb. Modern methods of treatment have made it possible for children to live and thrive when born between six and seven months after conception. If a child is expelled from

the womb in the first four months of pregnancy, it is commonly called an *abortion*. If the expulsion takes place after the fourth month, but before the time when the child is viable, it is known as a *miscarriage*, and if the child is born after the period of viability, and yet before the usual limit of pregnancy, it is known as *premature labor*.

This brings us to consider the natural limit of pregnancy in the human species. It was formerly supposed that from two hundred and seventy to two hundred and eighty days was the usual period of gestation, but recent study has shown that while it is true in the majority of cases, yet occasionally gestation may be prolonged to three hundred days, and even more, and still a perfectly healthy child be born after a safe and speedy labor.

On the other hand, it is not infrequent for children to be born at any time between the two hundredth and two hundred and eightieth day after conception, and survive and flourish. Keeping these facts in mind, we can readily explain the miscalculations which occasionally arise, and the fact that children are sometimes born before their mothers are ready for them, before the arrival of the nurse, and when they are quite unexpected; and again, a delay of several weeks may occur, giving rise to much annoyance and anxiety, and yet the whole be simply a delayed process. If we ask ourselves in what consists a perfectly healthy pregnancy, we may define it somewhat as follows: It is the natural growth and development of the child in the womb, extending through a period, on the average, of nine months, and resulting in the birth of a child sufficiently strong to subsist with the aid of the mother's care.

During this time, changes go on in the body of the mother as the child grows and develops. She frequently gains somewhat in weight, and increase in all of the tissues of her body takes place. As pregnancy progresses, the organs of respiration and digestion become encroached upon by the growing child, and hence modifications in every function result, which are adapted to the increased demand made upon her respiratory

and digestive functions. She is obliged to breathe and to digest for two, and hence in many instances a feeling of well-being and an increase of appetite take place. In other cases the burden of the new life seems excessive, and weakness and prostration may denote that her powers are unequal to the task; but in the main, among healthy women, after the first months are past, the general health is in a condition of comparative vigor. The wonderful changes which go on during these nine months are but imperfectly understood by even scientists. It is sufficient to say that if the mother remembers the dual life which she is leading, and that there is developing within her a being which not only breathes through the oxygen contained in her blood, but in addition is forming a nervous system, and receiving through her nervous system the transmission of some of the sensations which she experiences, the meaning and scope of what is meant by a natural pregnancy become more apparent.

We introduce these apparently abstract scientific remarks to impress upon the minds of mothers the fact that their habits and environment during the period of pregnancy are forming not only the shape and size and health of the unborn child, but also its mental and physical peculiarities. It should be remembered that a normal pregnancy is a distinctly natural and physiological process; that certain tissues and developmental forces resident in the woman's body have been given to her for this purpose, and that her forebodings and dread are to be tempered by the thought that she is thus fulfilling a design which results, in the healthy person, not in disease nor in death, but in the performance of a function which is part of her healthy life.

CHAPTER VII.

MISCARRIAGE.

It is necessary that we should also describe abortion and miscarriage, and draw attention to dangers which attend them. The two symptoms of abortion and miscarriage, which should at once arouse solicitude, are flooding and pain. They denote that the child is in danger of being separated from the womb, or that such separation has already occurred. This may be caused by disease on the part of the mother, and especially frequently by undue exertion or violence. Thus, as in a case which we recall, the use of a sewing-machine for half a day, in a woman who was not accustomed to active work, resulted in abortion. Thoughtless lifting or undue exertion in reaching up to high shelves, or hanging up clothing, has also caused abortion. A sudden shock, as falling down stairs, or being thrown from a carriage, or severely jolted upon a rough road, or in an elevator, or upon a railway train, has resulted in this accident.

Occasionally, in persons who seem predisposed to abortion or miscarriage, a very slight jar will bring on this misfortune. Thus, a mis-step in the street has caused abortion. Sudden nervous or mental shock, grief and terror, have been repeatedly effectual; in great disasters, where a city has been burned, or where a section of country has been suddenly attacked by a hostile army, or in time of sudden disaster of any sort, as during the Johnstown calamity, large numbers of women suffered from abortion or miscarriage.

The occurrence of flooding and pain in a woman who is pregnant should lead to her placing herself instantly at perfect rest, and sending for her physician. She should lie down, loosen her clothing, keep absolutely quiet, and summon medical aid as soon as possible. The dangers of such accidents are the

bleeding which accompanies them, and the fact that, unless especial care is taken, women frequently do not recover health promptly, but suffer from various disorders afterwards. The physician's treatment and orders should be strictly carried out, and especially in the matter of remaining absolutely quiet until he gives permission to move about. Women not infrequently think that rest in bed for a week or ten days after hemorrhage has ceased is quite sufficient for perfect recovery. This, however, is very rarely true, and frequently the avoidance of exertion from eight weeks to three or four months is needed to result in perfect restoration to health. If the physician's limit as to remaining recumbent were more generally observed, women would suffer far less frequently from the consequences of these accidents.

If women are so situated that they cannot obtain medical aid promptly, and flooding and pain continue, by keeping absolutely recumbent, the head low upon the bed, possibly without a pillow, and by the exercise of the greatest cleanliness while the hemorrhage persists, they will do all that they can to favor a good recovery. It is especially important that, should a friend be present sufficiently experienced to understand what is going on, she should abstain in any way from touching the bag of fluid in which the child is contained until it has been expelled from the mother's body. Otherwise, she may precipitate a dangerous complication.

CHAPTER VIII.

DISEASES AFFECTING THE WOMAN DURING PREGNANCY.

Diseases occurring in pregnant women commonly occasion more than usual anxiety on the part of the patient and her friends. This anxiety is based upon good grounds, for if a pregnant woman becomes ill with some acute disease, her

pregnancy adds greatly to her danger. In fevers, occurring in such patients, the danger to mother and child becomes great in proportion as the patient's temperature is high and remains considerably elevated. Thus, in typhoid fever, in malarial fever, in rheumatic fever, and in pneumonia, often known as lung fever, if the patient's temperature does not rise very high nor remain elevated for a considerable time, the patient's chances for recovery and those of her child are much better than if the fever is severe and prolonged. If abortion should occur during an illness, it is an injurious accident for the mother. She is apt to have severe flooding, and there is danger that some form of inflammation will attack the womb.

It sometimes happens that the organs in the body which remove waste materials from the blood fail to properly perform their functions during pregnancy. This results in the storing up of poisonous material in the patient's body, and when this poisonous matter becomes sufficiently abundant, it poisons the brain and spinal cord, and causes convulsions. This is known as eclampsia, or convulsions occurring in pregnancy. They are likely to come on sometimes without warning, and more often after the patient has suffered with headache, dimness of vision, a sense of heaviness and lassitude, accompanied by a gradual diminution of the product of the kidneys. Symptoms such as these, when observed by a nurse or by the patient herself, should cause her to instantly consult her physician.

Eclamptic convulsions occurring during pregnancy resemble epileptic fits; they are more dangerous than epileptic fits, for many patients die in this condition. The convulsions usually bring on the labor, and the child sometimes survives and often perishes. If the patient suffers from headache, lack of vision, and diminished amount of kidney secretion, no time should be lost in communicating with her physician.

It has long been a tradition that women who have incipient consumption become better in health if they marry and bear children; this is one of the many groundless beliefs extant. It is true that during the pregnancy the mother's health and

strength may improve under the influence of the increased nutrition which pregnancy brings: so soon, however, as the pregnancy ends, the disease which existed before pregnancy began goes on with increased severity. It is wrong for women who have incipient consumption, or for women who have a strong hereditary tendency to consumption and are themselves not robust, to marry and bear children. If this truth were acknowledged, much would be accomplished to check the spread of consumption. There is also a possibility that the child, when born, will be found affected by the same disease. A woman suffering from consumption should by no means nurse her child, as there is danger of conveying tuberculosis through her milk.

Nervous diseases sometimes develop during pregnancy, and among these, St. Vitus's dance is not uncommon. Insanity is sometimes precipitated by pregnancy and the puerperal state. Where the mother has been healthy before she became pregnant, she will probably recover her mental condition in a short time after the child is born. Where, however, the mother has a strong tendency to insanity, the chance for her permanent recovery is not so good.

It has always been thought that pregnant women were especially liable to those diseases which are accompanied by eruptions: this opinion is well founded. The danger in these cases arises from the fever which accompanies them, from the liability to interruption of the pregnancy, and the danger of blood-poisoning which complicates such an accident. Cases of extraordinary resistance to such contagion are occasionally observed, and women have been known to nurse a child suffering from scarlatina without themselves contracting it. Such could scarcely be the case if the woman were pregnant and cared for another child ill with scarlatina. Where abortion or labor occurs in these cases, especial precautions regarding cleanliness should be observed, as the danger of blood-poisoning is much greater than ordinarily.

Women who have disease of the heart are often exceedingly

anxious lest pregnancy should terminate in a dangerous and severe labor. Fortunately, such fears have no great basis for their existence. It is remarkable how women who have suffered from heart-disease for many years will pass through a pregnancy and labor not only without growing worse, but oftentimes with apparent improvement. A patient's fears upon this point are happily generally without foundation, for when pregnancy terminates in labor, a remarkable degree of strength is often developed in the action of the heart. Women may receive severe injury during pregnancy from accidents, or from assault in occasional cases; it is the rule, however, that if the mother be healthy, the pregnancy is often not interrupted, but the mother may recover, and the child continue to live until term.

CHAPTER IX.

HYGIENE OF PREGNANCY—DIET.

There can be no more important subject than the hygiene of pregnancy, and, as would be naturally inferred, the question of food is of the greatest interest. There are prevailing certain absurd ideas regarding the influence of the mother's diet upon the size and development of the child. It is alleged that by maintaining a continuous diet of fruit, and by carefully avoiding such articles of food as would contain matter nutritious for the child's skeleton, that children of small size and with easily-moulded and soft heads will be born as a consequence. While it may be possible by starving the mother to starve her child, yet no more injurious practice could be followed than one which diminishes the strength of the mother, and brings her to face the ordeal of labor with impoverished blood and depressed nervous system.

The contrary is true,—that the patient needs a most abundant and easily-digested diet which shall be rich in nutrient material

in proportion to the demands upon her for her own nourishment and that of her child. The question of drink during pregnancy is one which must be determined by reference to the usual habits of the patient. If she has been accustomed to drink wine and beer, there would be no objection to her continuing the practice in moderation. But if not, she will do well not to commence the use of stimulants while pregnant. The question of diet, however, is greatly influenced by the irritability of the patient's stomach and her incapacity to digest large quantities of food, which are especially pronounced during the first four months.

The phenomenon known as morning sickness may be described as follows: Soon after waking in the morning, and usually as soon as the head is raised from the pillow, the patient is suddenly seized with a desire to empty the stomach. When this desire is gratified, the sensation of nausea disappears, and soon after the patient is able to take a little food. In perfectly healthy women, where this derangement does not become severe, no treatment is necessary; if the patient drinks a glass of water and then ejects it at once, no harm is done, and in a few moments she will often be able to retain food. Very frequently, this disagreeable symptom may be avoided by taking a small quantity of very easily digested food before the head is raised from the pillow. A little stimulant will prove effectual when food does not. Thus, a cup of well-made broth, rather highly seasoned and hot; a small cup of cocoa, tea, or coffee, especially black coffee; a small glass of champagne, other wines, or bitter ale or beer; sometimes a little cordial, as Chartreuse; brandy and soda, koumiss, and in hot weather a very little ice-cream,—all these are occasionally successful in giving relief, and in promoting an appetite for a subsequent breakfast.

The patient must understand that the trouble is what is known as reflex; that the growing of the child in the womb produces some irritation about the womb which is transmitted along its nerves to the nerves of the stomach. As a rule,

when four months of pregnancy have passed, this disorder ceases, and usually a good appetite is enjoyed for the remainder of the time.

We desire to warn the patient against using drugs of any sort for morning sickness. When excessive acidity of the stomach is present, bicarbonate of sodium, or the soda-mint sold in the shops will be of use, but narcotics and remedies addressed to the nervous system should be taken upon a physician's prescription only. The appetite of the pregnant woman is likely to be peculiar, and, in fact, a number of cases are on record where the first intimation that the woman had of her condition was a sense of delight or of loathing at the existence of some especial article of diet, generally a reversal of the usual appetite.

Pregnant women frequently seem to have excessively abnormal appetites, which are known as "longings." If these be analyzed, they will usually be found to be expressions of desire for the sort of food which will best nourish herself and her unborn child. A hint may often be taken from these longings, and the needed article of diet may thus be supplied to the patient.

If food is important during pregnancy, it must be remembered that digestive power is commonly so lessened that a smaller amount than usual can be digested at any one time. Hence it is often necessary not to take three full meals in twenty-four hours, but to have five or six lunches or lighter meals instead. These may be taken at intervals of four or five hours, and are often admissible at such intervals as to come after the patient has lain down and slept for a short time.

CHAPTER X.

HYGIENE OF PREGNANCY—EXERCISE AND CLOTHING.

If proper nutrition is important for the pregnant woman, it must be remembered that there is no agent so efficient in producing this as sleep. Rest and sleep should be taken with regularity and abundance; eight or nine hours at night, and from one to three during the daytime, are not too much for a person of average development. If sleep is interrupted, rest can often be taken at intervals most convenient. This should consist not only in the semi-recumbent position in a chair, but also in lying on a comfortable couch or bed. It quite often happens that if the child be vigorous, its movements within the womb may prevent sleep at night, and then rest in the day may be substituted.

To keep up the condition of comfortable health, exercise is fully as important as food and sleep. Best of all is walking in moderation. Climbing stairs, lifting, running a sewing-machine, moving the arms rapidly, and excessively long walks are all extremely injurious, and likely to produce subsequent trouble; but a walk carefully graduated to the patient's strength and sensations in the earlier months of pregnancy, and driving in a comfortable vehicle in the latter months are especially indicated. The amount of housework incumbent upon a woman in comfortable circumstances usually suffices in ordinary cases.

Exercise, however, will be uncomfortable and impossible without injury unless the patient is properly dressed. The very word *enceinte* denotes a person who is not wearing clothing closely belted about her. So soon as pregnancy is discovered, the ordinary corset should be laid aside. Some form of clothing should be adopted which supports the skirts upon the shoulders. There are a number of these devices in the market,

and the patient must choose that which fits her most comfortably.

Even in moderately warm weather, woollen underclothing should be worn. In winter, the Jaeger system of woollen underwear, and in warm weather, the finer and thinner goods similar are best, and should cover the body to the wrists and ankles. Garters should be made as loose as possible, or, better, discarded for some other device. No portion of the clothing should fit tightly, and should support for the abdomen be demanded, an abdominal bandage, or waist coming from the shoulders over the abdomen, may be employed. In driving, great care should be taken that wraps are always within reach to avoid chilling the surface of the body. Easy shoes, loose-fitting wraps, and those forms of clothing which allow the freest movement of the chest should be worn. It is almost needless to say that, in the changeful climates of this country, thin woollen should be worn next to the skin for at least ten months of the year.

Fig. 1.

Abdominal bandage for support in pregnancy.

CHAPTER XI.

HYGIENE OF PREGNANCY—BATHING—CARE OF NERVOUS SYSTEM.

The care of the skin is a very important detail; the bath should be daily, avoiding extremes* of hot or cold water, to be taken in the manner least likely to fatigue the patient, followed by gentle friction, and by repose in a recumbent posture for at least half an hour. A very disagreeable itching and burning in some parts of the body frequently occur during

pregnancy. The advice of the physician should be at once sought, and occasionally the patient can do much to relieve herself by dissolving in the water of the bath sufficient sodium bicarbonate to give a smooth feeling to the fingers, or, occasionally, a warm bath into which bran has been mixed will be found an advantage.

The nervous system of the patient undergoes modifications fully as great as those of other organs. In the beginning, a period of despondency may occasion great anxiety on the part of the patient and her friends. She will often urge her physician to relieve her from the continuation of her condition, fearing its results for the child and herself. Other women feel much better than usually when in this condition, and are hopeful and courageous from the first. It should be remembered that forebodings and despondency have no basis of fact whatever, but are simply manifestations of the physical condition of the patient. They should be disregarded by her, her mind occupied as pleasantly and constantly as possible, and she should train herself to look forward to the termination of this trial with anticipations not of disaster, but of great happiness subsequently. Those about her should be careful to encourage her in this belief, and especially nurses, and women who have already had children, with whom she may come in contact, should forbear from relating accounts of dangers and complicated cases which they have seen or experienced. Such is the heartless idiocy of gossips, whether professional or otherwise, that they seem never happy unless relating some chapter of horrors in which they imagine that they have been heroines. When we pause to consider, however, that these stories are always exaggerated for the purpose of magnifying their own exploits, we readily see on what slight basis of truth most of them rest. The professional nurse who knows no better than to alarm pregnant women with tales of dreadful confinements should not receive a second engagement from any one.

Occasional peculiarities in temper and temperament, not usually characteristic of the patient, should be kindly ascribed

by her friends to her changed condition, and treated as purely physical and transient, with the greatest kindness. The patient herself and her friends should remember that the condition of her mind and her nervous system has an important bearing upon that of her unborn child. Intelligent women have frequently surrounded themselves during this period with all that was lofty, beautiful, and pleasing. It was the custom among the Greeks to take especial pains that nothing should be presented to the view of such women except the most beautiful scenery and the most artistic forms. The aid of music and recitations from the poets were also invoked that the child's brain might be tuned, as it were, while still in process of construction, for that which was most beautiful. In modern times, we recall an instance of an intelligent woman leading a quiet life, who, during her pregnancy, chose such literature for her reading and such associations as she judged most likely to develop pure and good tastes in her child, and the result fully justified her precautions.

It is commonly supposed that the sight of a dreadful object, the receipt of sudden and dreadful news, great and horrible danger, the witnessing of a crime, or any great shock, often result in some permanent deformity or malformation in the child. There is certainly a basis of truth for this belief sufficient to cause a woman in this condition to carefully avoid anything which is dangerous or terrifying. There can be no doubt that the mother's previous habits and also those during her pregnancy have a decided influence upon the formation of those of her child. The responsibility devolving upon parents can be readily appreciated on consideration of this fact. So far as the formation of a healthy brain and nervous system of the child go, regularity in habits upon the part of the mother, and the avoidance of exciting and endangering causes, with abstinence from stimulants,—in fact, a life as tranquil and happy as possible during these nine months,—can hardly fail to give the child the best possible chance for healthy development.

CHAPTER XII.

CONSTIPATION.

The most common trouble from which patients suffer during this period is that of constipation. This is generally worse during the first few months, and during the last six or eight weeks. It is to be remedied so far as possible by a carefully-arranged diet in which whole wheat flour, fresh vegetables, fruits, and a free supply of water form a large part. Constipation is especially dangerous in pregnancy, and the greatest pains must be taken to avoid it. Drugs should be taken on the advice of a physician only. The simplest remedies should be employed as long as possible, and not abandoned hastily. Thus, a regular habit in this matter is of the greatest importance. A glass of cold water, or of hot water, taken in the morning as soon as the patient rises, a small glass of one of the mineral waters, the gluten suppositories furnished by most druggists, or, if this fail, glycerin suppositories may be employed. Enemata will generally succeed in the failure of the other means which have been described, and should be composed of water only, or white castile soapsuds to which castor oil has been added, the whole beaten up together and administered while warm, and, occasionally, enemata in which the yolk of a raw egg and a few drops of spirits of turpentine have been beaten up in the soapsuds. The best time for the use of such an injection is usually before retiring, or soon after waking in the morning.

Irritability of the bladder is also a source of great annoyance to pregnant women, and is frequently relieved by assuming the recumbent posture. It is caused by the pressure of the enlarged womb, which is removed by such change in the position. Salivation or excessive flow of saliva is occasionally a

great annoyance, and can hardly be treated without the advice of a physician.

The care of the teeth, however, is a matter which each woman should look after herself. After the fourth or fifth month of pregnancy she should visit her dentist, no matter whether she have suspicions that all is not right with her teeth or not. Her condition frequently gives rise to some change in the teeth, and this should be taken in hand promptly before it has gone sufficiently far to cause permanent trouble. Certain disorders of the skin not infrequently arise, and among them the curious formation known as the "mask of pregnancy." This is a peculiar pigmentation, often of a brownish-yellow, forming upon the forehead and face, and usually persisting during this time. It is caused by a deposit of coloring matter similar to that which is observed in other regions of the body during pregnancy. As a rule, it gradually fades away after the birth of the child, and it is not amenable to treatment. Although unpleasant, it is not in the least harmful, and should be let alone and disregarded as far as possible. The care of the skin, however, is a matter of very considerable importance. The pregnant woman, in common with others, eliminates from the body, through the skin, poisonous material which is especially dangerous in her condition.

CHAPTER XIII.

HYGIENE OF PREGNANCY—BREASTS—VARICOSE VEINS.

One of the most important matters for consideration is the care of the breasts. As pregnancy advances they become more prominent, firmer in consistence, and a deposit of coloring matter takes place about the nipple. Small projecting bodies are also seen in the colored ring which surrounds the nipple, and these are small and auxiliary glands. In some rare

cases the breasts become so turgid early in pregnancy as to demand the use of a supporting bandage, or of some applications of a soothing character. The care of the nipple itself is of extreme importance with regard to the subsequent nursing of the child. It not infrequently happens that from a lack of development the nipple is so flat and sunken that the child cannot grasp it. Fissures and cracks of the nipple, occasioning much distress when the child nurses, are also frequently met with.

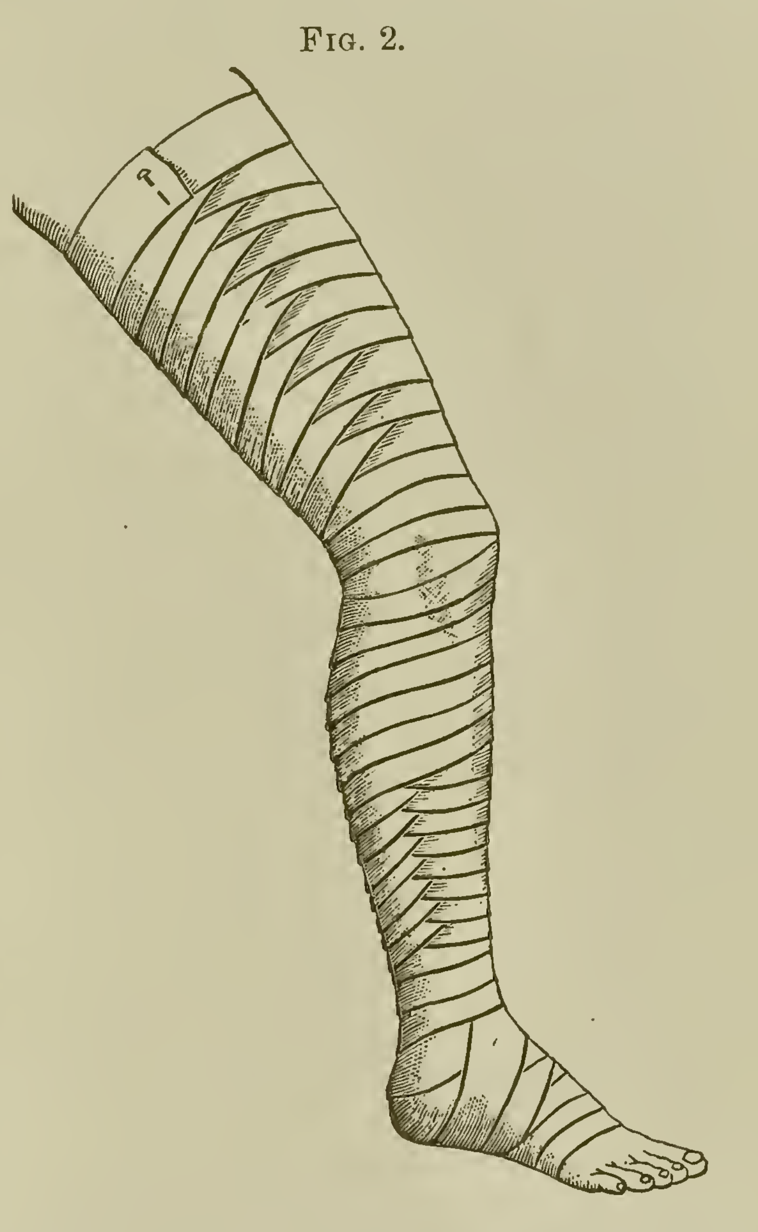
In cases of flat and retracted nipples, persistent efforts should be made to draw out and develop them during the months of pregnancy. This can be done by the thumb and finger, and should never be made a painful process. Occasionally a suction pump, called a breast-pump, and to be obtained at druggists, may be employed to advantage. A healthy nipple should stand upon the breast much as a raspberry stands upon its stem, and if this relative situation be not present, the child may have trouble subsequently in nursing. To avoid cracks and painful fissures in the nipple it is better not to apply hardening agents which make its surface more brittle and more apt to crack, but to use some soothing ointment instead. The nipple should be washed at least once daily with warm water and castile soap. Afterwards it should be gently drawn out between the thumb and finger, and anointed with cold cream or cocoa butter. If fissures and cracks occur, the attention of the physician should be immediately called to them. If the breasts become uncomfortably heavy during pregnancy, they may be supported by a breast bandage, to be described later. Should great turgidity, sharp pain, and some fever be present, inflammation of the breasts is threatened, and the physician should be summoned at once. Very frequently, the use of borax-water, one tablespoonful to the pint or half-pint, is of great service in bathing the nipple, in preventing soreness and fissures.

The chronic constipation of which we have spoken, together with the pressure of the womb upon the intestines, not infre-

quently results in the development of hemorrhoids, or in aggravating such as may be already present. Care should be taken to avoid constipation, and the physician's advice promptly summoned in such cases.

Varicose veins in the legs, and sometimes about the lower portion of the abdomen, may occasion great distress, and in the case of repeated pregnancy may become so greatly distended as to threaten rupture. They often cause great discomfort by reason of a sensation of weight and heaviness in the legs, and occasionally they are accompanied by intense itching.

Fig. 2.



The most convenient and comfortable means of support for varicose veins is a bandage three inches wide, made of old, soft flannel. This should be applied in the morning before rising, while the patient is recumbent. It should begin at the toes and extend to the groin. Several of these bandages should be provided, and washed repeatedly, and thus a convenient and neat form of support is furnished. When once the knack of applying them is acquired, they are more convenient than silk and rubber stockings, which are frequently used, as they can be varied in the tightness and looseness of application, and so

meet the individual needs of each case better than a less easily adjusted support. It is well to powder the skin over the varicose vein with finely-powdered borax, or with common rice-powder.

Varicose veins occasionally become excessively distended, and rupture causes serious hemorrhage. Should this accident occur, the patient should lie flat at once upon the nearest convenient support. The person aiding her may take a clean handkerchief, fold it into a square pad about two inches or so, and place the pad directly over the point of rupture. A bandage should be taken, and the limb bandaged from the toes up over the pad at the point of rupture. The leg should then be elevated upon a pillow, and a physician summoned (Fig. 2). It must be remembered that a bandage or string simply tied about the leg above or at the point of rupture may not only fail to check the hemorrhage, but may cause dangerous compression of the vein, increasing the bleeding; so the whole leg must be included in a compression-bandage, to be effectual. If a bandage is not available, an old sheet may be torn up and one hastily improvised. Moderate pressure may be made with the hand upon the folded handkerchief, at the point of rupture, until assistance can arrive and the leg be bandaged.

CHAPTER XIV.

GENERAL HYGIENE OF PREGNANCY—CLIMATE.

So far as the general hygiene of pregnancy is concerned, whatever conduces to the tranquillity and general health of the patient is advisable. The claims of society should give way entirely to the patient's condition. Such social pleasures as are productive of rest and diversion may be enjoyed so long as the point of fatigue is not reached. But no restriction of dress and no positive engagements should be made which

might necessitate the patient's discomfort and cause a tax upon her strength. So far as society has claims they are utterly insignificant compared with the claims of the patient's own necessities and those of her unborn child.

In persons who are able to vary their residence at will to secure the best possible climate at each season of the year, it may be advised that extremes of heat and cold and rigorous climates be carefully avoided. It would be best for the period of pregnancy to be passed in a temperate and equable climate where a large percentage of the days were fair, where extremes of temperature did not occur, and where severe storms were very infrequent. Such a climate would permit of the greatest amount of out-door exercise, and be the most favorable for the patient. This, however, is rarely obtainable in our latitude, and the fatigue and risk of a long journey to obtain such a climate might overbalance the advantages to be gained by it. However, the modern luxuries of travel are making it more easily possible for frail and invalid persons to seek suitable climates, and hence the pregnant woman who has the necessary means may choose a suitable climate at will. As a general thing, long journeys are to be avoided, not only because of the danger of abortion caused by the jolting of railway cars and the motion of a steamer, but on account also of the difficulty of carrying out that regular and systematic care which the patient's daily life demands. Amusements of various kinds often serve an important purpose in lessening the tedium of the patient's enforced retirement and in diverting her mind, and so long as fatigue and annoyance are avoided, they are a valuable adjunct in securing her well-being.

It cannot be impressed upon the patient too strongly that she should consult her physician as soon as her condition is suspected or known. Modern obstetric science does not wait for complications to occur at labor, but endeavors by a careful scrutiny of the mother to anticipate and prevent them. It is possible for the physician to ascertain with comparative ease whether the mother is naturally shaped and developed, the

position which her child occupies in the womb, its comparative vigor and development, and whether the general conditions favorable to a successful labor are present. Should the child be of excessive size in proportion to the mother; should the mother be smaller than the average, or deformed, or the victim of a dangerous and chronic illness, it is possible to so treat her as to give the best possible chance for the life of her child and her own recovery. This must be done, however, some time before the termination of the ninth month of gestation, and hence the necessity for a careful examination of the patient as early as possible. Certain grave diseases which often threaten the pregnant woman can be detected and so treated as to give her child and herself the best chance for ultimate recovery. This preliminary examination by the physician can be conveniently made at the patient's house, the patient occupying a recumbent position, and does not necessarily call for anything painful or disagreeable. It is the physician's duty to make this examination, and it should be, and has been found to be, a source of comfort and encouragement to his patient.

CHAPTER XV.

NURSE AND ROOM.

It is well to select a nurse early in this period, and to send the nurse as soon as possible to call upon the physician. No nurse should be taken in whom the physician has not confidence or who is not personally acceptable to him. The patient should remember that he is responsible for the nurse, and that, in the event of injury through her carelessness, criticism would fall not only upon the nurse, but also upon the physician. It is well to send the nurse to the physician early in the case to give him an opportunity to have any articles prepared for his patient which his methods of treatment may demand. No

two physicians conduct a confinement in exactly the same manner, and physicians who are attentive to details, and who study their patient's comfort, are constantly devising methods and various appliances for her well-being. It is important for these reasons that doctor and nurse have an early and distinct understanding as to the way in which the patient is to be treated. The nurse should take an inventory of what the patient has prepared for her confinement, and the patient should add such articles, if needed, as are deemed necessary by the physician. In case of accident and premature termination of the pregnancy, the fact that the nurse is prepared will be found a great comfort indeed.

In the selection of a nurse it is well to choose one who has been thoroughly educated. It does not make so much difference how many confinements she has attended, or what doctors she has nursed for, or who have had her previously. It is of the greatest importance, however, that she understand the use of antiseptics, and that she has been so thoroughly trained that she will not meddle with the case, but will carry out the doctor's orders. Ambitious nurses who anticipate the doctor's questions by giving their own opinions, who always know that everything is right, who do not mention the minor complications until the doctor asks about them, but who treat them themselves, are not to be chosen, nor are nurses who are so far superior to their profession as to be ashamed to wear the uniform of the school from which they come.

In choosing a room for the patient's use during confinement, one which is quiet, sunny, airy, and clean should be chosen. It is well that no plumbing should open into the room; in other words, that no waste-pipe, connecting with the sewer, should be in the room. This, of course, would include the modern wash-stand and closet; but cases have been observed where these conveniences were sources of disease because of the germs conveyed through them from the sewer. It is better to have a room without carpets, in which rugs can be employed, with but few hangings, and with no article which

cannot be thoroughly cleaned and, if necessary, fumigated before the labor. An adjoining bedroom for the nurse and the infant is a great convenience, and will do much to favor the mother's repose. The furniture of the room should be comfortable, but all superfluous articles should be removed. The bed should be a single bed, or three-quarters, not too low, and, preferably, not placed against the wall. It is very essential for the convenience of the nurse and the physician that the bed should be easily accessible in all directions. It should not have very elastic springs, although the ordinary woven wire mattress is not objectionable. The mattress should be of hair, and a liberal supply of linen and blankets should be provided. An experienced nurse will understand thoroughly the preparation of a bed for confinement, and will tell her patient in advance the articles required. It may be stated, however, that, in addition to the usual sheets, a half-dozen old sheets are an advantage; several old blankets, and two pieces of white rubber sheeting, one yard wide and covering the whole width of the bed, should be provided.

The dress of the nurse is of importance not only as a matter of discipline, but also from the fact that carelessness in her dress may be a source of danger to her patient. The uniform of training schools consists of a "wash" dress, covered by a large apron and by linen over-sleeves, which can be frequently renewed. As it is essential that nothing come in contact with the patient, or come near her, which is not perfectly clean, it will readily be seen that untidy dress on the part of the nurse is a positive source of danger to the patient. If the nurse's washing is done in the house, the necessity for frequent changes of dresses and aprons should be kept in mind, and fulfilled as far as possible. The nurse's apron may contain but little starch to advantage, as it is thus less noisy about the patient. She should wear noiseless shoes; at night, felt slippers are useful, and during the day, slippers or pumps with over-gaiters, or a shoe made of some noiseless leather, as kangaroo-skin, are indicated.

CHAPTER XVI.

APPLIANCES FOR THE MOTHER.

THERE are a number of appliances which can be employed to advantage in making the mother comfortable, and in promoting her recovery. She will need a certain number of napkins for the reception of what is known as the lochial discharge. It has been customary to use those which were washed and used repeatedly, but for many reasons it is better, if possible, to have them so made that they can be burned as soon as they are soiled. Any simple absorbent material, which the nurse may dip into an antiseptic solution previously and then wring out and dry, will be suitable for this purpose. The cheapest quality of cheese-cloth sold in the shops is an excellent material. The absorbent substance may be enclosed between two layers of cheese-cloth and loosely stitched at the edges. We have found that a napkin may be made by taking a piece of oakum about three inches wide and eight or nine inches long and an inch thick. On each side of this is placed the cheapest quality of cotton batting an inch thick. The whole is then enclosed between the two layers of a piece of cheese-cloth twelve or fifteen inches long and sufficiently wide to cover them. The cut edge of the cheese-cloth is closed with cheap cotton thread, the whole napkin is dipped in a solution of bichloride of mercury (one to two thousand) and is wrung out and dried. The cost of these napkins, when all the material is purchased at wholesale, is a cent and a quarter each. When purchased at retail, between two and three cents. The ordinary patient will need six daily for the first three or four days, and four afterwards for a period of ten days or two weeks. It makes no difference whether they are made precisely after this description, so long as the principle is carried out of an absorbent

substance which can be made antiseptic, and which is cheap and easily destroyed.

It is customary among most women to wear after confinement an abdominal bandage or binder. In the case of strong and healthy women, this is not a necessity, but it is a means of comfort to all, as a rule, and as such it may be employed. The



Fig. 3.

Buttoned binder.

common belief, that it has much to do with restoring the woman's figure to its former proportions, has not much foundation in fact. If the patient be strong and well developed, the abdominal muscles will regain their former firmness, and thus the shape of the body will be restored. There are various sorts of binders, the simplest being a strip of hemmed muslin

about a foot wide and from twenty-four inches to a yard in length. Whatever form be employed, they must be so made that they can be frequently washed. The binder which we illustrate was devised originally in England, and has met with great acceptance in that and other countries. This binder is nine and a half inches wide and a yard long. Twelve inches from either end is a gusset four and a half inches deep and four inches wide at the bottom, its widest part. The binder is made of two thicknesses of cloth, preferably, light canvas or muslin. At one end of the binder are two rows of button-holes, one row at the edge, seven in number, one and one-half inches apart, and a second row parallel to the first, one and a half inches distant from it. At the other end of the binder are three rows of linen buttons, one inch and three-quarters apart. At the lower edge of the binder, and midway between the two gussets, are two pairs of buttons to which a napkin may be fastened from below. The application of the binder is as follows: Immediately after confinement, when the abdomen is large, the row of buttons nearest the edge is buttoned into the row of button-holes also nearest the edge. As the abdomen becomes smaller, the rows of buttons are advanced successively to the rows of button-holes, and thus the length of the bandage may be varied to suit the needs of the case. A useful binder may also be prepared by putting gussets in an ordinary strip of hemmed muslin, and fastening the binder by pinning from above downward. The napkin worn by the patient should be pinned to the lower edge of the binder behind, and brought up and pinned to the lower edge of the binder in front.

In addition to the binder, a skilful nurse may prepare pillows and cushions of various sizes, made of cotton and cheese-cloth, which are cheap and can be readily burned when soiled. They may be placed under the patient's hips, and will add to her comfort by aiding her to change her position in bed (Figs. 4 and 5).

For use upon the breasts, a breast-binder or compression-bandage may be prepared as follows:

Fig. 4.

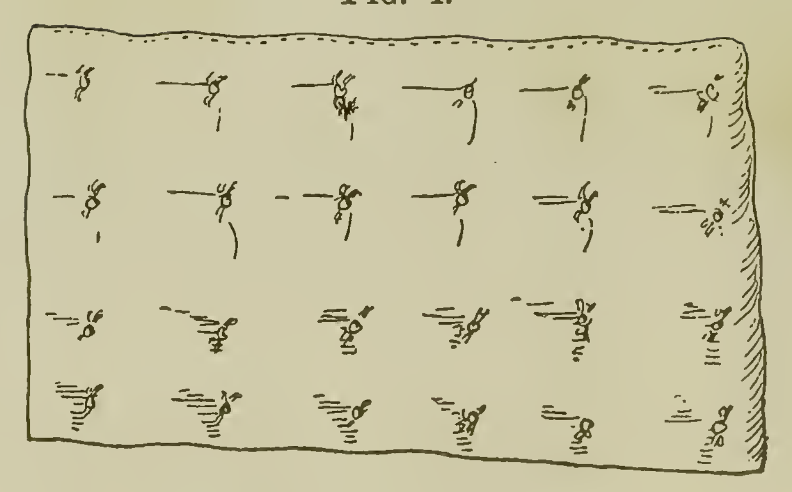
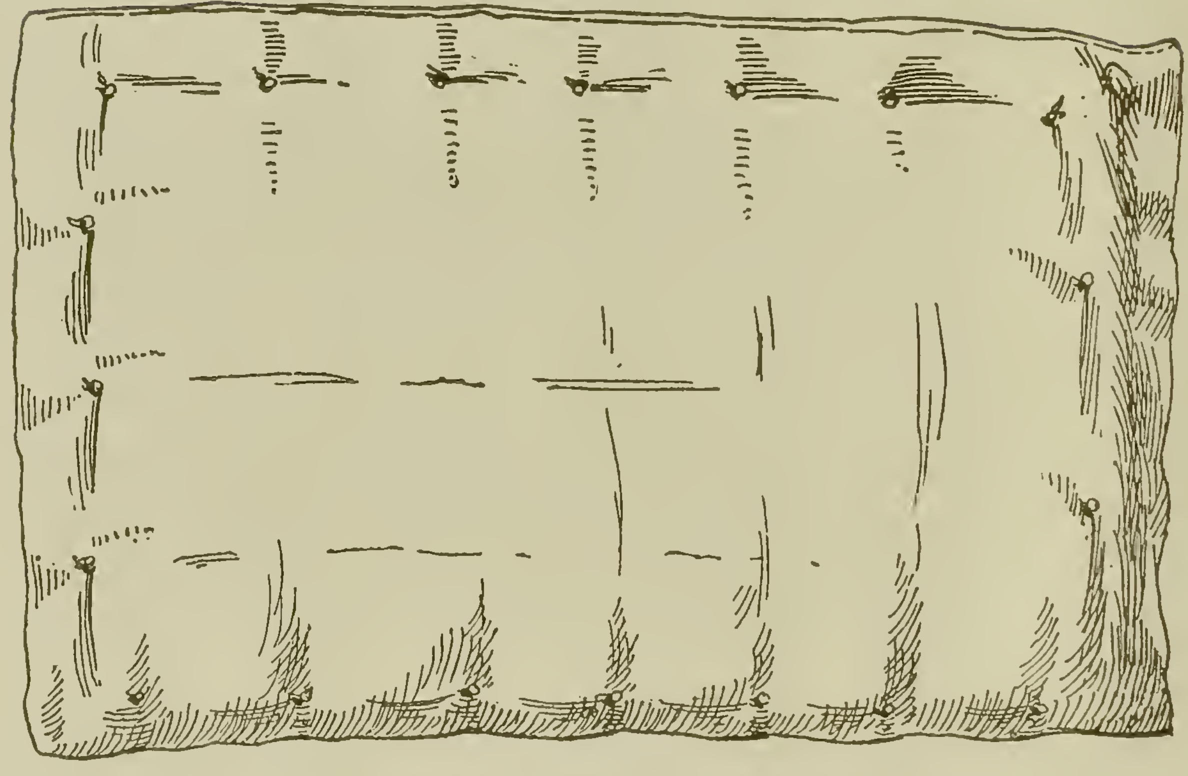
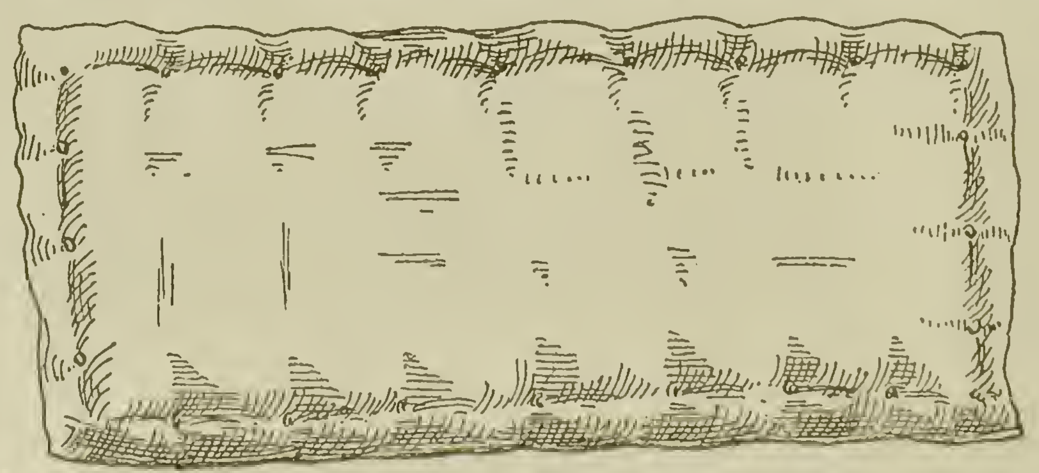


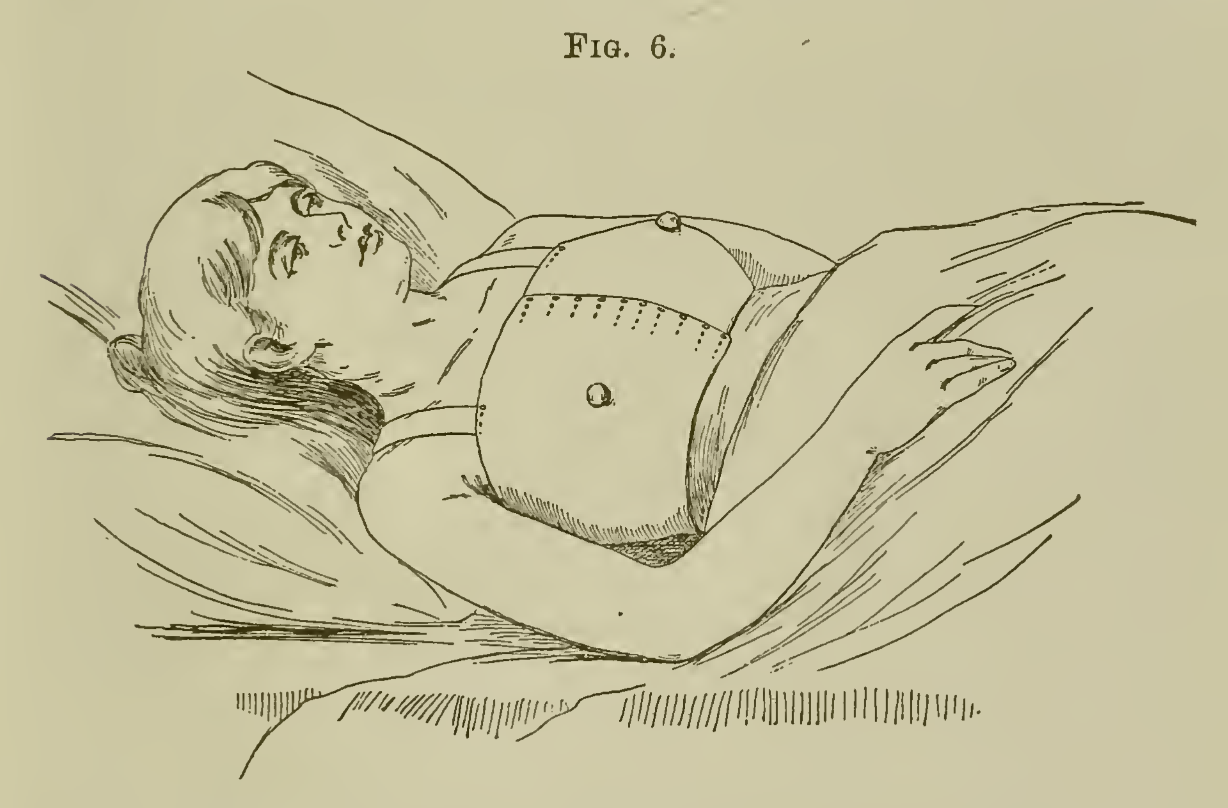
Fig. 5.





It is twenty-nine inches long by eight wide; three and a half inches from either extremity, and in the centre of the bandage, two holes have been cut the size of a quarter of a dollar, the edges of which are carefully overseamed to prevent the apertures from tearing out, the distance between them being the distance measured between the nipples. At the upper edge of the bandage, five inches from the end, two shoulder-straps are attached, two inches wide. The bandage is so applied that it pins over the centre of the chest between the breasts, the apertures giving room for the nipples, through which the child may nurse. The shoulder-straps come over the shoulders and may cross in front, or be pinned, without crossing, to the upper edge of the bandage after it has been

Fig. 6.



fastened about the body. The purpose of this bandage is to draw the breasts upward and inward, thus relieving the pain caused by engorgement. This bandage may be made of canton flannel or of firm muslin, as desired (Fig. 6).

A plentiful supply of old, soft linen is also desirable. Besides the articles already described, the nurse should see that the patient has ready in her possession such antiseptics as the

doctor may select, two ounces of the fluid extract of ergot, brandy or whiskey, a nipple-shield, and be sure that an abundance of hot water can be procured conveniently and immediately, if desired, in the room which the patient will occupy. There should be, if possible, no question regarding the burning of any bandage or inexpensive appliance which becomes soiled. Napkins can usually be rolled in a piece of newspaper and burned in the kitchen range or an open fire. Old night-dresses should be chosen for the patient's use while in bed, as it is sometimes convenient to tear them down the centre in front instead of slipping them off in the usual way.

CHAPTER XVII.

APPLIANCES FOR THE CHILD.

For the child, the elaborate and extensive wardrobes frequently purchased are worse than useless. Money is spent unnecessarily in what can hardly be, from the nature of the case, in good taste, and for what is often improperly made. The child's clothing should be warm, soft, compressing the body in no direction, and its weight, like the weight of its mother's clothing, should be supported from the shoulders. It has been the custom among Indians to pack the new-born child in moss, and some soft and warm material like moss would certainly represent an excellent dress for a child. The finest quality of flannel, or garments knit of the finest worsted, are usually the best. The wardrobe of the new-born child should consist, first, of a dressing for the umbilical cord, then of an abdominal band or belly-band over that; a diaper; a woollen or knit shirt with long sleeves, a woollen skirt, and a white shirt and skirt combined, over the whole. For the feet, worsted socks can be readily knit, which are not only most comfortable and suitable, but also pretty.

The best method of dressing the umbilical cord will be selected by the doctor, and will be outlined in the description of the conduct of labor.

Not more than a half-dozen changes of clothing are needed for the child in the beginning, as its size cannot, of course, be known before birth. The making of its later wardrobe furnishes a most agreeable occupation for its mother and friends. If the baby's clothing be properly made, there need be but one pin employed in the whole dressing, and that a diaper-pin. Other garments should be fastened by strings or buttons. An abundance of diapers should be provided for the child, of cotton or linen, of such a size that when folded once they are less than a half-yard square; and doubtless before many years some cheap, soft, and absorbent material, like Japanese paper, may be found which can be destroyed as soon as it has become soiled, thus obviating the necessity for washing.

A description of the various babies' wardrobes devised by different nations would furnish an extensive catalogue of such articles: the pappoose of the Indian mother is familiar as a national relic, and her Scandinavian and German friends have embodied the same principle in what is known as the "child's mattress." This consists of a soft and thin mattress quilted and heavily wadded, but sufficiently large to contain the child, and permit of its being folded over its body. The child is thinly dressed, laid upon the mattress, and the mattress folded over it and held in place by an embroidered band about three inches in width, which is crossed and recrossed over the child diagonally. The child thus becomes virtually a little bundle, and can be transported with great ease (Fig. 7). Such a device, however, is only of use during journeys, and, in the main, the mattress is too warm to be constantly worn. It is sometimes advantageous, however, either to employ something like the mattress if the child goes out in its carriage, or to take especial pains that the child's limbs and body are protected by a warm mattress in the bottom of the carriage, and by a thick, soft afghan or lap robe.

Former generations of American children were dressed upon the principle of low neck and short sleeves, and those who remember this usage will assert in support of it that children so dressed were certainly as robust and well developed as any at the present day. While that may be true, experience proves that to-day the best clothing for the infant child is woollen or silk of various grades of thicknesses, covering the entire body. Thus, an exceptionally fine and robust infant has been dressed in a silk undershirt and two petticoats sewed upon one waist or body, the whole so arranged that the child is dressed practically simultaneously.

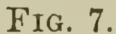
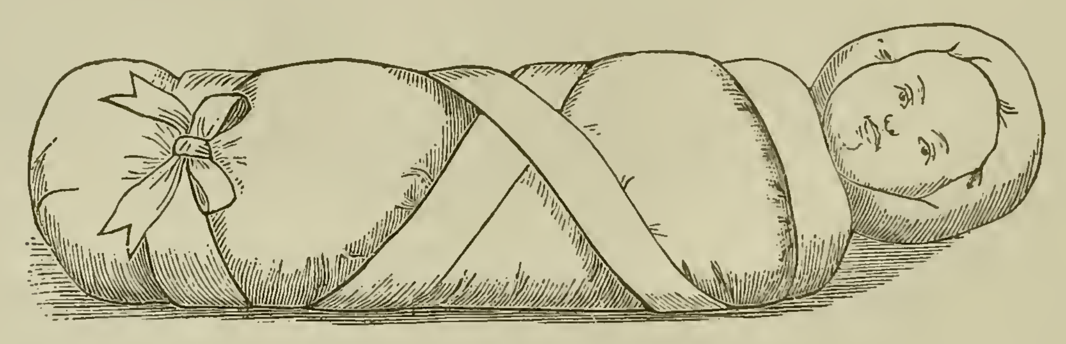


Fig. 7.



During the heated term it is especially desirable that the infant live as much in the open air as possible, and that the surface of its body be protected from sudden changes of temperature, from moisture, and from draughts. This is best accomplished by removing all superfluous wraps and coverings, and dressing the child from neck to heels in the lightest and finest flannel. The difference in the customs of heating dwellings has also necessitated some difference in the clothing of children. The house clothing of the child must be proportionately much lighter than the clothing which it wears out of doors, because the average house is overheated, and the change is thereby greatly exaggerated from the air in-doors to the out-door atmosphere.

The ordinary baby's cap, which covers the back of the head and the ears, is wisely planned, for the infant child has thus portions of the head carefully protected which are easily injured. It must be remembered also that the infant's eyes

are extremely sensitive, and hence its face should be shielded from the light by a veil or some suitable covering. The ignorance and stupidity of the average child's maid who takes the baby upon the street in a carriage, its face upturned and frequently exposed to bright sunshine while she gossips with some other servant or with the traditional park policeman, cannot fail to result in some injury to the infant's sight.

CHAPTER XVIII.

CHILD'S CRADLE AND BASKET.

The cradle or sleeping-place of the child has been made the centre of most of the poetry of infancy. Whether the baby be rocked on the tree-top, carried on the back of its mother, or rolled up in a bundle with other baggage, it is still cradled in some fashion or other, even when lying upon her arm in bed. It is needless to say that from the day of birth the infant is entitled to its own separate, undisturbed sleeping-place. It should not sleep with the mother, it should not be rocked and jolted while asleep, and if it is expected to become a rational and thinking person, it should be accorded those opportunities for undisturbed repose which are necessary to the nourishment of any normal brain. Despite the desire of mothers to keep the child with them, of grandmothers and nurses to trot the baby and sing the baby to sleep, it is far better that the child, soon after its birth, should be taken to its place of sleep, placed comfortably upon a suitable bed, properly covered, and left entirely alone. Such is the unthinking zeal of many nurses and friends of mothers that such an education for the child is possible only among the most intelligent people, in whom reason predominates over tradition and prejudice. The objections to placing the child in bed with the mother, among people of the better class, are

that the child inspires the air contaminated by the mother's secretions and excretions; that the constant tendency is for the child to nurse too frequently, and that the repose of the mother and child is mutually disturbed. Among people of the poorer class and among the vicious, carelessness, excessive fatigue, and drunkenness on the part of the mother result in a considerable mortality among infants from what is known as overlaying. Owing to the mother's carelessness, or during the profound sleep of exhaustion or drunkenness, the child slips down beneath the mother's side, she rolls over upon it, and it dies from pressure and asphyxia. If the mother is without assistance, she may place the infant alongside of her bed in any suitable receptacle, but not in the bed with herself. We recently visited a happy mother, fertile in expedients, not rich in this world's goods, but rich in the possession of a fine baby, who took a clean, dry wash-tub, filled it full of blankets, and placed her baby in it upon a pillow. The baby slept peacefully beside the mother, and both were happy and contented. Ordinarily, a solidly-built crib without rockers will be found most convenient and advantageous. This, of course, should be surrounded by sides sufficiently high to obviate any danger of the child's falling out. The mattress should be moderately firm, the child's pillow low, and when put to sleep, the child should be carefully guarded from the light.

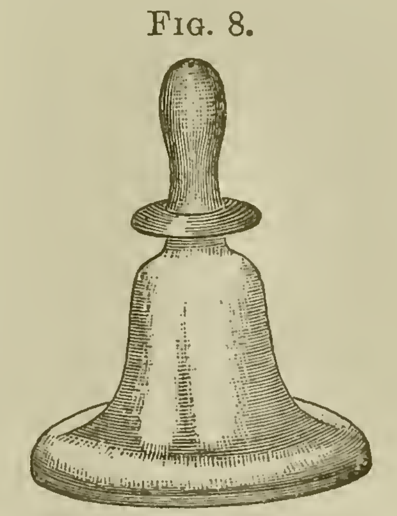
The contents of the bassinet (or baby-basket) should consist of the baby's toilet articles: simple rice powder, a little pot of white vaseline or cold cream, white Castile or spermaceti soap, and such other articles as an experienced nurse or mother may deem necessary. Appended is a list of an outfit which has been found of practical use: brush and comb, skein of white twisted embroidery silk, soft, fine sponge, bottle of white vaseline. sharp pair of pointed scissors, powder-box and puff, with talc powder; pin-cushion, small and large safety-pins, pure Castile soap, pair of socks, some old, fine linen, flannel or knitted band, flannel shirt, a petticoat and night-gown for infant; an afghan or piece of extra flannel, in which to wrap the

child; also piece of flannel, or old blanket, to receive it in; in addition, the baby will require eight day-dresses, eight night-gowns, eight white skirts, four day-flannel skirts, four night-flannel skirts, four pairs of day-socks, four pairs of night-socks, six flannel shirts, six flannel bands, three dozen small, soft, linen diapers, three dozen larger, cotton ones, at least two little knitted sacks.

The following description of a *crocheted baby-band* is taken from "Babyhood," vol. iii. page 33: Single zephyr in ridge stitch,—that is, half stitch, in which, going back and forth, only the back half of the stitches in the lower row are picked up. Begin on a chain of fifty and crochet forty-eight ridges, hence ninety-six rows. Join by a row of plain stitches, and at top by a picot edging (five chains and a tight stitch back into the first).

To prevent chafing and excoriation of the infant skin, many mothers employ some favorite dusting-powder, and others who are very fond of the perfume of violet, have used powdered orris-root, and, as we have had occasion to remark, some of the finest babies we have ever seen were not powdered at all, but anointed with simple ointment. It is of the greatest importance that the mother prepare not only the clothing for the child and articles intended for herself, but also that she prepare herself to nurse the child. We have described the care of the nipple, and this should be persistently kept up until the day of confinement. A nipple-shield (Fig. 8) should be included in her outfit, and if there has been trouble in drawing out the nipple, the simplest form of breast-pump should also be at hand. Unless she be the victim of some infection, she should have no other idea but that of nursing the child. She will remember that while a substance resembling milk may be present in the breast for some months prior

Fig. 8.



Nipple-shield.

to the birth of the child, yet the formation of fully-formed milk will not take place until several days after confinement, and that fully-established lactation is a portion of the process of childbirth.

CHAPTER XIX.

LABOR.

A BRIEF description of what is meant by normal labor may be of service to the patient in understanding the preparations to be made for it and the care to be given her during that time. Labor may be divided into three stages or divisions. The first of these is the period occupied in the gradual opening of the womb, and is a preparatory stage to the expulsion of the child. This stage lasts in first confinements a number of hours, varying greatly with the individual case. It is, as a rule, shorter in repeated confinements, and also attended with less pain. The pain which is present during this stage is generally characterized as grinding, or bearing down, oftentimes commencing in the back and extending downward over the abdomen. It is most annoying and difficult to endure, as the patient cannot appreciate that progress is making, and realizes only what seems to be useless suffering.

When, however, the womb is open, ready for the expulsion of the child, the membranes in which the child is contained rupture, there is an escape of fluid, and the birth of the child begins. This is a comparatively short interval in normal cases, compared with the first stage, and is usually completed under the care of a physician, and oftentimes with the use of anæsthetics. After the birth of the child, the after-birth or placenta still remains, and is expelled after a brief interval resembling the first period.

It is of especial interest to know the symptoms which indicate that labor has actually begun. For some days before, the

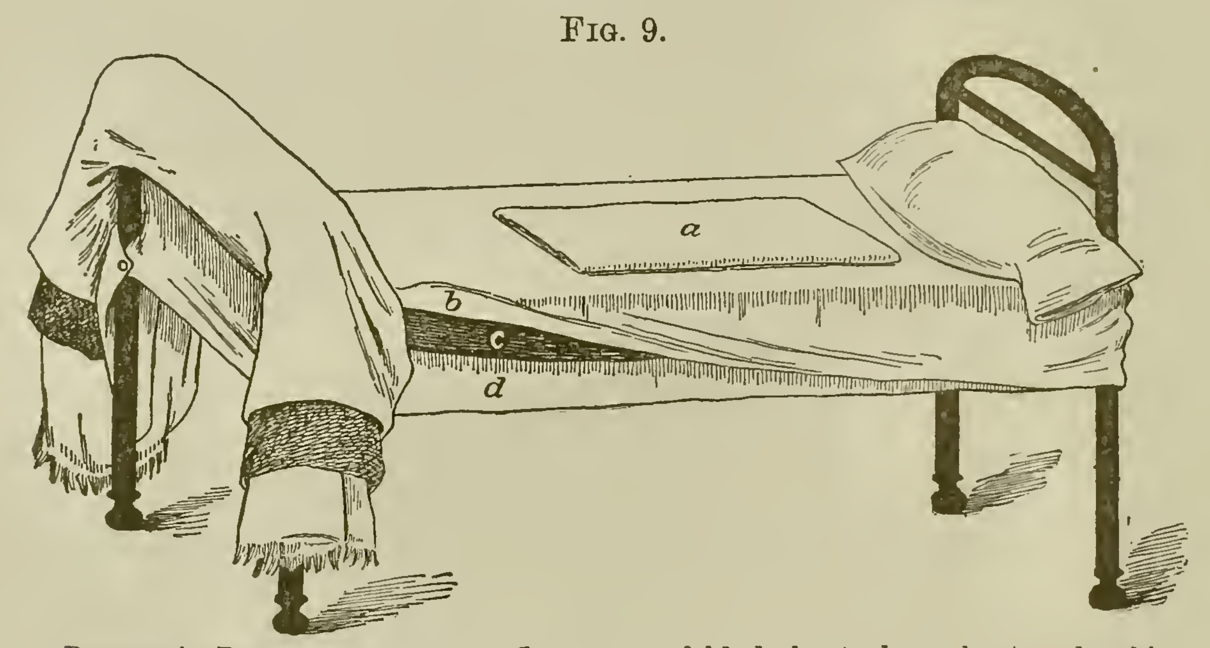
patient frequently suffers from pain in the back and in the thighs, from a feeling of weight or heaviness about the lower portion of the body, and is often extremely uncomfortable. These pains may be worse at night, and become so severe that the physician may be sent for, under the impression that birth has actually commenced. Subsequently, however, such pains die away, and there is a gradual return to a condition of comparative comfort. There is this difference between so-called false and true labor pains, that the false or fugitive pains are irregular, coming and then going, and diminishing instead of increasing in intensity, while true pains at the beginning of labor grow steadily stronger, and are located more and more in the abdomen. This will enable the patient to distinguish between these two classes of pains.

During the first stage of labor, all that can be done for the patient is to place her in the most comfortable position possible, to sustain her strength, and to assist her to have patience until the more active progress of labor begins. It is best for her not to lie down at once in first labor, but to continue in the erect or semi-erect position, walking about the room, sitting, standing, or kneeling, as may be most comforting to herself. If the nurse be present, she will look after certain matters of importance at this stage. If the woman be without a nurse, she will do well to see that everything is in readiness, and also, if possible, to secure a movement of the bowels, and to see that water is passed freely. In women in repeated labors, who have borne many children, the first stage may be so short that the patient has to lie down at once, and if her labor come on suddenly when she is alone, it is not safe for her to continue upon her feet, as the danger is that the labor will be too rapid for the mother, and the child be injured (Fig. 9). She should lie down at once, preferably upon her left side, and remain as quietly as possible until assistance arrives.

The second and third stages of labor are almost invariably conducted by some competent physician, but occasionally it happens, especially in strong and healthy women who have

borne children repeatedly, that labor may be completed so quickly that assistance does not arrive until all is over. A neighbor or friend can always be summoned, and with such assistance—so perfect are the provisions of nature—it is quite possible for a woman to have a perfectly successful labor without skilled service. It is well for whoever is with her to see

Fig. 9.



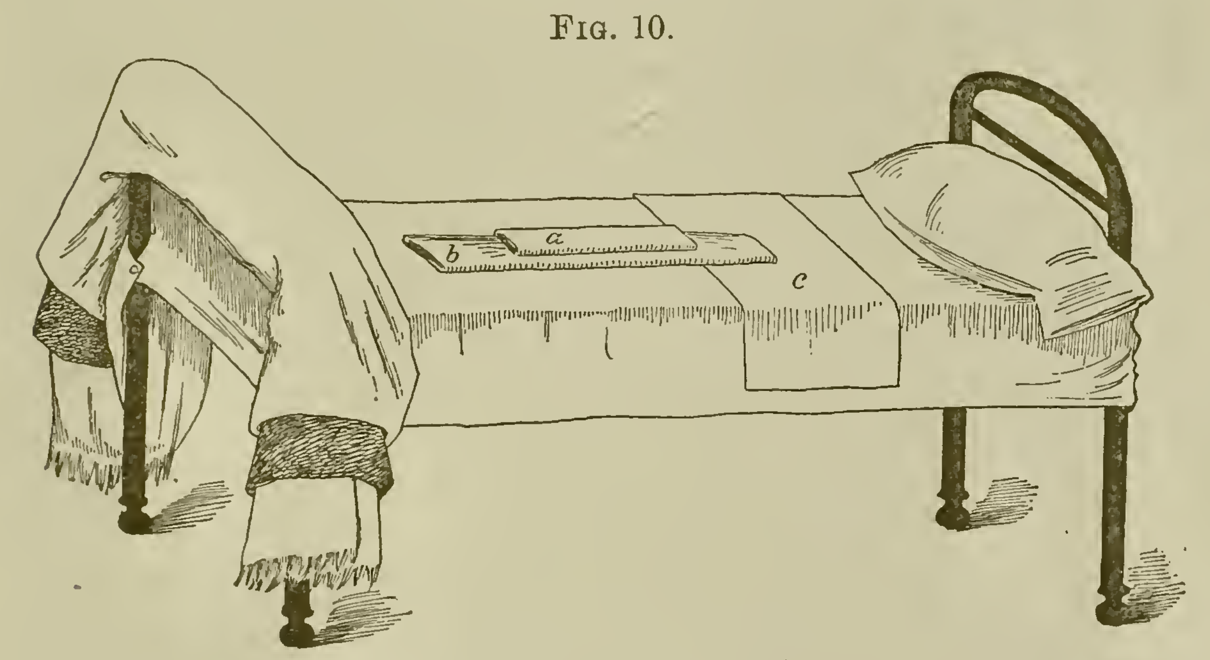
Patient's Bed, prepared for Labor.—*a*, folded sheet; *b*, *c*, sheet and rubber sheet, which are removed with *a*, when soiled during labor; *d*, clean sheet, on which patient lies after labor.

that during the birth of the child she lies upon the left side, with the thighs bent up towards the abdomen. The person who helps her should wash her hands carefully, and as the head of the child is born should endeavor to support it, pressing it gently upward between the thighs towards the mother's abdomen. When the child is born, the cord should be grasped between the thumb and finger, when it will be felt to pulsate, and when this beating ceases, it should be tied firmly with a bit of strong thread, three fingers'-breadth from the child's navel. It should be tied a second time, half an inch nearer the mother than the first tie, and cut between the two threads. The mother should then be kept perfectly quiet while her helper may place her hand over the abdomen and make gentle pressure. After a few moments, pains resembling

those experienced during the birth of the child will return, and the after-birth will be expelled. The assistant should be very careful that she does not break the after-birth, but as she lifts it away it should be received very carefully in both hands and removed. The patient can then be bathed with warm water and soap and left quietly in bed, a clean towel and folded sheet (Fig. 10) having been placed beneath her.

Should flooding come on after the birth of the child, the patient's assistant should place the hand upon the abdomen and rub it gently but rapidly. She will then feel the enlarged womb

Fig. 10.



Bed after Labor,—soiled linen removed and patient's bandage and napkin ready for use.—*a*, *b*, napkin; *c*, binder.

like a hard ball, the size of the baby's head, just beneath her hand. So long as this ball remains hard, there is not much danger of severe bleeding. When it becomes large and soft, then the rubbing should be repeated until contraction recurs. These simple directions may prove of value in case a physician or experienced nurse cannot be obtained, but it must be distinctly understood that the conduct of labor is a matter requiring the greatest skill and wisdom, and should never be undertaken without the supervision of an intelligent physician. Even if the labor have proceeded normally without assistance, a doctor

should be summoned as soon as possible, and should be asked to examine the patient thoroughly, as some injury may have happened, or some complication resulted which makes his services of the greatest importance, even although the child has been born.

But returning to the care of the patient during her labor when she has the advantage of the assistance of a physician and nurse, it must be remembered that the process is one which taxes her strength severely, and that she needs all which can support and sustain. While a large quantity of food cannot be advantageously taken at any one time, yet nourishment in the form of broth, milk, egg beaten up with wine, cocoa, and any easily-digested article of food is much needed if the case be prolonged. Occasionally, stimulation is required, but that should be limited to tea or coffee, except by the doctor's orders. There is danger of the patient taking cold if care be not exercised to keep her room warm enough, and to look carefully after her clothing. The directions which have been given already to the patient without assistance, will be carried out, of course, by the nurse.

CHAPTER XX.

PUERPERAL FEVER.

The care of the patient during the latter part of labor, and afterwards, cannot be intelligently understood unless something be said regarding what is meant by blood-poisoning, puerperal fever, and antisepsis. It is within the present century that the two prominent teachers of obstetrics in the city of Philadelphia declared that puerperal fever was in no way caused by the physician or nurse, but was entirely beyond their control. Puerperal fever, they taught, occurred as typhoid, malaria, rheumatism, and other diseases which were not contagious,

but depended upon some unknown condition of the atmosphere or the influence of the soil for their existence. Meanwhile, in Austria, the discovery had been made that puerperal fever generally resulted when the physician had been dissecting or making a post-mortem examination, and then immediately attended an obstetric case. When disinfectants were used by such a physician, and especially when his hands were carefully scrubbed and then disinfected, his patients escaped puerperal fever. One of the brightest honors of the many which Oliver Wendell Holmes has won is the fact that at this time, and while he stood practically alone in the American profession in his opinions upon this point, he answered in a most trenchant article the teachings of the Philadelphia professors to whom allusion has been made, proving that they were wrong, and asserting positively that the Austrian discoveries were correct, and that puerperal fever was contagious, or, according to a popular phrase, "catching." We think commonly of Dr. Holmes as a poet, a wit, a literary man, but the services which he rendered in urging the truth regarding this matter upon the profession in his country, and the number of lives which have been saved by the knowledge of the true nature of puerperal fever, can never be appreciated.

At the present day, we know positively, as far as any knowledge is obtainable by human beings, that puerperal fever is caused by a living ferment, and that in the vast majority of cases some one who touches the patient, usually the doctor or nurse, gives her puerperal fever. It is at once apparent that certain strenuous precautions are imperative upon those who attend such patients. Clean hands, clean instruments and appliances, clean bedding about the patient, scrupulous cleanliness regarding herself, and, as an additional safeguard, the use of certain chemicals to cleanse the hands, instruments, and appliances which touch her, are what every woman has a right to demand in the present state of our knowledge. This recent knowledge should be of the greatest comfort and advantage to the woman who is about to become a mother. She has the

satisfaction of knowing that the most dreaded complication of maternity has been reduced to a minimum, and that where such intelligent care is given, her chances for safety and a good recovery and the safety of her child are many times greater than in the last century. The fearful epidemics which at times destroyed large numbers of women are unknown in the practice of intelligent men. There still remain a number of physicians and nurses who have not informed themselves regarding the causes and prevention of puerperal fever, who do not know how to recognize some forms of this disease when they arise, and who cast doubts upon our knowledge regarding its origin and prevention. Such objections, however, are no more to be considered in the discharge of duty towards patients or friends than are the theories of those who dispute the utility of vaccination or the fact that typhoid fever is caused by impure drinking-water.

The living germs which cause puerperal fever have their most common production in the decomposition of the tissues or fluids of some animal. Hence it is extremely dangerous when the after-birth is not expelled, but remains in the womb, where it is liable to decompose. After it has been expelled it should be destroyed, if possible, by fire, or buried with lime. The lochial discharge is also liable to decompose, and hence the necessity for frequently changing the napkins used to receive it, and for employing such napkins as have been prepared by antiseptics. Antiseptics are certain substances which have the property of destroying these living germs. Such are corrosive sublimate (bichloride of mercury) and carbolic acid. One of these is usually employed as an antiseptic or ferment-killer in caring for the patient during and after labor. The hands of the physician and nurse, as well as all instruments and appliances used, should be not only cleansed but also rendered free from ferments by the action of one of these substances, or heat. We know that equally powerful with chemical antiseptics is the action of a high degree of heat; hence a piece of cloth which has been thoroughly boiled cannot contain poison-

ous germs, and so it is comparatively easy to render clothing and bedding safe for use; but the hands cannot be boiled, and there are certain appliances and instruments which are also damaged by heat, and so it is necessary not only to employ heat, but to make use of chemical antiseptics. The reason why we have urged that the napkins be burned and not used again is because they may not be thoroughly cleansed in washing, and when used a second time may retain decomposing material which is easily absorbed by the patient, causing puerperal fever, or blood-poisoning. We have taken the liberty of introducing what may seem to be a purely scientific discussion as to the nature of puerperal fever, but we know from experience that the average woman of intelligence is not willing to accept a certain routine because her grandmother was cared for in that way, but that she is fully aware of the advance made by modern science in a general way, desires to profit by it, and is ready and anxious to co-operate with any sensible physician who will do her the justice which her intelligence deserves.

CHAPTER XXI.

FIRST FEW DAYS AFTER CONFINEMENT.

The mother's first needs, after labor, will naturally be rest and quiet. It very often happens that the excessive exertion of labor and the perspiration which frequently accompanies it render the patient especially susceptible to cold, and hence the contact of the air after labor very often results in a slight chill. This is partly owing, also, to the nervous exhaustion and prostration from which the patient naturally suffers. It is of no importance, and should be treated by placing an extra blanket over the patient, or by giving a cup of hot tea, or some other acceptable hot drink. It cannot be too strongly insisted that the mother's greatest needs after confinement are

rest and quiet. The congratulations of friends, the idle curiosity of those who are ready to intrude into a sick-room, should be warded off from the patient, and having been assured by the evidence of her own sight and touch that her child is living and safe, she should be given some slight nourishment or stimulant, as a cup of broth or of tea, or a glass of milk, and then allowed to go quietly to sleep. One of the great uses of the trained nurse in the sick-room is the somewhat disagreeable but necessary function of police, and in proportion as she is allowed to control the patient, in that proportion can the physician's orders be intelligently carried out. In healthy women, a refreshing slumber of from two to four hours will follow delivery. This period gives the nurse ample opportunity to wash and dress the baby, and affords the child also an occasion for obtaining sleep.

The mother's diet is not subject to the fear which formerly existed, that generous food produced puerperal fever or inflammations of some sort. It is the kind of food and the intervals at which it is given which occasion distress. and not the fact that the food is nutritious or abundant. For the first three or four days the most easily digested food is indicated; milk, broth, soups, milk-toast, soft-boiled eggs, koumiss, cocoa, and stewed fruits should be employed, the intervals of feeding being governed somewhat by the mother's desires. Nourishment, however, should be taken from four to six times in the twenty-four hours during the first three or four days. After this period, an abundant but easily-digested diet may be allowed, embracing any articles which agree with the patient. The old fear that acids and salads could not be taken is erroneous, as the acid is digested in the body, and the practical test of any article is not whether it is an acid or not, but whether it agrees or disagrees with the patient. Whatever agrees with her makes good milk for her child. The patient should be fed abundantly, and food may be taken in small quantities, if it be easily digested, as often as four or six times a day, although the mother may be up and about and able to resume her household duties.

After the third or fourth day, as we have already remarked, the patient's diet may be governed by her appetite. Certain sorts of food have been recommended as especially adapted to produce a flow of healthy milk. Extract of malt can be taken by many mothers with advantage. Young and tender sugar beets, it is said, may be eaten; beer and porter seem, in some cases, to take a place which nothing else will fill. Milk as a beverage, foods made of milk, and cocoa are often sufficient; but the general principle that that which is best digested and the most thoroughly enjoyed is the best food very rarely leads us astray. So small a thing as the use of water as a beverage is sometimes overlooked in caring for such patients. At the third or fourth day the physician will usually prescribe a thorough laxative. After this time, the bowels should be moved by the simplest and mildest measures; an injection of castor oil and soapsuds beaten up together and warmed, or of simple salt and water, the use of a gluten suppository, or a glycerin suppository, will generally be sufficient. Compound licorice powder, sold by druggists, will agree well with many patients, and some preparation of *cascara sagrada* is often efficient. It should be remembered that a dose of any laxative medicine which failed to produce an effect during pregnancy will often be sufficient to purge a patient violently after labor. Thus we recall a case where a woman who had taken very active cathartics during pregnancy urged her physician to give her a "strong pill," as she expressed it, the fourth day after labor. He could not yield to her request, but prescribed simple doses of licorice powder, which acted far too energetically for the patient's comfort. This difference is caused by the fact, already mentioned, that the enlarged womb, before confinement, presses upon the intestines, preventing their emptying. When the womb is emptied, after the delivery of the child, there is no obstruction then to movements of the bowels. The womb grows smaller after the expulsion of the child by process of contraction, which causes pain similar to that experienced during labor. These are called after-pains, and after the

birth of the second or third child are frequently so severe as to keep the patient awake at night. A warm cloth or fomentation over the abdomen will often relieve them, and if not, a physician's prescription must be obtained.

The diet of a mother after childbirth usually consists of ordinary sick-diet. The object of keeping a woman on diet of this kind is simply because she is in bed, her digestive system is rather weakened by the excessive strain, mental and otherwise, which she has gone through, with fatigue, and liquid nourishment can be given which is more readily digested and quickly absorbed than solid food.

Doctors simply differ in their advice because patients differ in regard to their digestion. Sometimes a woman is ordered a mutton-chop, a bowl of thick gruel, or some milk-toast immediately after a confinement; others, again, are allowed to get up before the ninth day.

The family physician knows the peculiarities of his case, and is capable of judging what is best for his patient. Strong, healthy women can do many things that the frail and delicate cannot attempt.

As the supply of milk contains so large a quantity of water (almost ninety parts in a hundred), a great deal of the food which the mother takes should be liquid to supply this demand. If a mother loses her baby in childbirth, and it is necessary to check the flow of milk, not only is it necessary to put belladonna plasters on the breasts, but also to diminish the amount of fluid taken.

If she wishes to increase the flow of milk, she should drink freely of milk, soups, water, and may also rub the breasts with some castor oil. It is probable that in this way the use of alcoholic stimulants, as beer and porter in large amounts, became fashionable for the purpose of increasing the milk-supply.

Though excellent at times for delicate, worn-out women, we certainly would oppose their universal use. Alcohol rather lessens the milk-flow.

The preparations of malt are far more valuable, as they increase the appetite and aid digestion.

There being a determination of blood to the mammary glands during the secretion of milk, many substances may be carried along with it that should be thrown off in other ways; thus, medicines are often secreted by the milk, and affect the child, that are intended to have a purgative action on the mother; a dose of castor oil will act sometimes in this way. Articles of diet also affect milk.

We are all familiar with the garlic taste given to milk and retained in the butter, from cows turned out to grass in the spring-time. And, indeed, cases have occurred of acute poisoning by milk from cows that have eaten largely of poisonous herbs in the pasture-field.

Although a mixed diet, containing a free supply of vegetable food, also of animal food, of the cereals, together with a proper amount of fluid, is important for every nursing mother, there are certain times when additions should be made to one of these divisions of food to supply a demand; thus, if a child is emaciating, does not seem to increase in weight, the free use of fats by the mother, as cod liver oil, will soon be followed by an improvement in the health of her babe. If there is a tendency to rickets, the mother should eat more largely of preparations containing lime, such as oatmeal, cracked wheat, or even take lime itself.

A woman who is fat and well nourished may have the poorest kind of milk for her baby; all the nourishment goes to herself, the milk probably being of a very thin, watery kind. Indeed, in the choice of a wet-nurse, it is often found that the lean but healthy woman gives the most and the best milk.

Constipation resulting from torpidity of the liver, or overfeeding, will frequently affect the milk and cause it to disagree with the child. Not alone is milk altered in its nourishing qualities, or in its digestibility, by materials not belonging to it or entering into its composition, but we very frequently have

indigestion produced by milk which has probably been changed in its characteristics by emotion, by strong nervous impressions due to worriment, fright, or the fatigues of society; certainly, late dinner-parties, both from the character of the food and the late hour, would not be conducive to the production of nourishing milk.

We have stated that regularity is the fundamental law to be observed by the nursing mother.

DIET.

The diet of the nursing woman should always be carefully regulated, for upon it greatly depends the amount and character of her milk. It is impossible to lay down any laws in regard to the kind of food she should have.

Every sensible person knows what agrees with her and what does not; little indiscretions may be pardoned when she alone has to suffer, but when indigestion means an infant with indigestion also, greater care should be observed. It is not the *amount* of food one takes, but the quantity one *digests* that should regulate the diet.

Some people manage to live on much less than others because the waste is less. A too generous meat diet, rich milk, cheese, and wines or beer will give the liver a heavy load to carry, and so-called biliousness will result.

Therefore, a nursing woman should avoid this extreme. A too liberal diet of farinaceous food, potatoes, hot breads, oatmeal, etc., will produce flatulence and heart-burn.

The diet, therefore, should be a mixed one, suited to the individual, to the climate, to the amount of exercise she takes, and to her hereditary tendencies. A moderately rich milk, well-steamed rice, rare and juicy meats, tender fowls and game with fruits, light farinaceous and egg-puddings, well-made gruels, eggs, oysters, and fresh vegetables form the best dietary.

But all fried dishes should be avoided. Her food should be most plentiful, palatable, of the most nourishing quality, and frequently taken.

Bread, butter, and milk should be used in large amounts. A cup of hot coffee or chocolate in the morning, before rising; a substantial breakfast; the heaviest meal in the middle of the day; a light tea in the evening, with a bowl of gruel, such as oatmeal, the last thing upon retiring; a glass of milk just before or after each nursing, and possibly, if the patient feels much exhausted, malt extract will be of service.

It is absolutely essential that the nursing woman should keep her bowels regular. The skin, kidneys, and bowels throw off poisonous matters, which, if not gotten rid of in the natural way, will find themselves in the milk.

The organs of the body work as a co-operative association, and have a remarkable way of aiding one another. Should one organ become lazy or diseased, another will take its place. In this way the milk-glands, regardless of the welfare of the babe, will aid the kidneys, skin, or bowels.

Much is written on the subject of water-drinking. Some are very decided in opposition to water at meals, others to water between meals, others to water at any time. Water is the great solvent for all those substances which are properly called the *ashes* of the economy. The main ingredient of all the secretions and excretions of the body is water. The water should be pure, fresh, and not iced, and a fair amount should be taken with each meal.

Large amounts at meals will weaken the gastric juice and undoubtedly cause dyspepsia. But difficulty will just as readily attend the digestion of a meal which has not sufficient liquid with it to promote the secretion of the gastric juice.

A glass of water the last thing at night, or upon rising a glass of warm milk or a cup of *café au laït*, a glass of water with a pinch of table salt before breakfast, will frequently overcome the most obstinate constipation if persevered with. It is necessary that the bowels should be daily moved; this may be accomplished by a free vegetable diet, the moderate use of fruits, exercise in the open air, and an occasional enema, if required.

The use of purgatives should be confined to cascara cordial, compound licorice powder, a teaspoonful at night, Husband's magnesia, or effervescing citrate.

Great care should be taken by the mother that she does not take cold. It is well to have always a light shawl to throw over her while nursing her baby.

CHAPTER XXII.

MOTHER'S RECOVERY.

After lactation has become well established at the fourth or fifth day, the mother usually enters upon one of the most comfortable periods of her physical existence. For the time being she is, in a large measure, free from the anxieties and cares of daily life; the apprehension which she may have felt regarding the termination of her labor has given place to the joy and affection of maternity. If she is properly cared for, and is a healthy woman, she is generally extremely comfortable. The fatigue and soreness which follow labor have disappeared, her appetite rapidly returns, and is generally better than for weeks before her confinement. The companionship and care which she gives to her infant are a source of endless delight, and the affectionate solicitude of friends and relatives makes her the centre of all which is in the highest degree charming. It should be remembered, however, that while this period is one of repose, it is a time of the greatest activity in her physical organism. The balance between various functions of the body, which has been disturbed by the presence of the child in the womb, has been restored; the mother's blood, which was impoverished by the nourishment given to the child, begins to make good its losses; disturbances of the nervous system and mental depression have passed away, and in many cases a new era of physical development begins. The womb, which has

been enlarged many times its usual size to contain the child, undergoes a process of becoming smaller, the successful completion of which is of the greatest importance to the woman. The muscles of the abdomen, which have been stretched by the womb and its contents, must regain their former firmness and elasticity; this necessitates not only increased nutrition, but also increased absorption of portions of the enlarged womb. Hence it is that not only must the mother be fed, but those functions of the body which tend to remove material already used should be kept in full activity. The action of the skin should be maintained by daily bathing and massage; the bowels, which generally have become distended through the pressure of the enlarged womb, should be thoroughly and regularly emptied. Sufficient fluid should be taken to assist the kidneys in their work, while fresh air in abundance should be given to the patient to replace the gases exhaled through the lungs.

Sleep, the greatest promoter of nutrition, should be taken in abundance and with regularity, while the development and restoration of muscles over-distended or weak from lack of use may be encouraged by systematic massage. The patient must not exercise or assume the upright position for at least two weeks after the birth of her child, but passive exercise may be given by skilful massage after the first week of her lying-in period. This massage should begin with the arms and legs, the muscles being gently kneaded and the joints gently manipulated. The back may next be included, and gentle rubbing without severe kneading given to the chest and abdomen. This should be administered for fifteen minutes at first, increasing gradually until, at the third or fourth week after the birth of the child, the patient may enjoy three-quarters of an hour or even an hour of such treatment.

Possibly no more important crisis occurs in the mother's life than her getting up after confinement. There are various well-settled traditions which govern the actions of the majority of women; one is that the mother's nurse should remain in

all four weeks, hence the term "monthly nurse." Another belief is that at the tenth day, or after, the mother should sit up. Both traditions are the result of experience and observation of a vast number of cases of confinement, but neither has the slightest value as a guide in any given single case. It would be just as rational to say that because one mother is fond of a certain article of diet, and does well on it while nursing her child, that therefore every mother should eat exactly that amount, and be expected to enjoy it, as it is to say that every mother needs the same repose after confinement. It is a question for the physician, and for him only, to decide. It makes no difference what the patient's mother or grandmother or ancestors have done, nor what her dearest friend, confined a few months before her, has done, nor what every woman regarding whose confinement she has ever heard of has done. It is a question of careful study by the physician of the individual case. Women would be slow indeed, when reaching a certain age, to accept a costume exactly similar to that worn by every other woman at that age, and yet in a matter on which rests a mother's future health the endeavor is often made to enforce a uniform tradition. A woman who had borne a number of healthy children, and had retained her own beauty, health, and happiness, was asked the secret of her continued physical well-being. She replied. "For one thing, my mother never allows me to do anything for three months after the birth of a child. I get up when the doctor thinks best, and have no responsibility for at least three months." A woman after confinement was urged by her physician to remain recumbent two weeks; being told by a friend, a woman of very different constitution and strength, that she had gotten up upon the tenth day, she hastily summoned her physician upon that day, with the remark that she could not remain recumbent any longer. So great was her annoyance and restlessness that it was necessary to place her at once in a semi-recumbent posture upon a lounge, but the change in position marked a change in her progress towards recovery which, while it gave

rise to no serious complications, yet made an evident difference in her subsequent strength. It occasionally happens that a physician has the courage of his convictions, and positively refuses to be responsible for a patient who sits up before his best judgment permits, but the subject is one upon which both physicians and patients can profit by education and mutual study. It is quite true that the Indian squaw may drop out of the line of march of her tribe and, attended by one or two friends, crawl into a thicket and there be confined, and in two or three days rejoin her tribe at their next camp. It is also true that the healthy peasant woman of Europe, on the average, is able to leave the maternity hospital in which she has been confined on the tenth day thereafter, with a healthy baby in her arms. It is frequently observed that farmers' wives in America are often up upon the tenth day after confinement, but it is equally true that the more delicate inhabitants of towns and cities, especially women who have taken little exercise to develop their muscles, in whom the absurdities of fashion have dislocated the abdominal organs by tight lacing and weakened the patient's powers of recovery, are no more fit to get up the tenth day after confinement than they are fit to do the physical work of the squaw, the peasant woman, or the farmer's wife. They are the women who make the practice for physicians whose specialty is the treatment of the diseases of women, and they are the mothers who fail not only to recover their own health, but to nourish their offspring. In this connection it must be understood that, if the mother be healthy, it is of the greatest importance that she nurse the child. One of the best ways of reducing the womb to its usual size is nursing the infant, and it is a happy sign for the American people that at the present day it is considered not only not a disgrace but also a source of gratification and pride if a mother is able to nurse her child. The subject has been thought of such importance as to be legislated upon by several European countries, and the better physical development of American women, resulting from the fact that exercise has become

fashionable among the well-to-do, has resulted in furnishing mothers whose offspring not only profit by their better development, but can also be nursed by them up to a vigorous childhood.

CHAPTER XXIII.

DIET AND LACTATION.

It is often a matter of interest to know how healthy mother's milk may be recognized. Of course, the surest proof of the pudding is in the appearance and appetite of the one who eats, and a well-nourished baby cannot be such without good mother's milk. However, in appearance, poor mother's milk is very thin, bluish, or occasionally streaked with yellow or with red. A sore or cracked nipple may bleed when the child nurses, or a sore upon the nipple may form matter which discolors the milk. If the infant does not thrive, the physician can determine by suitable examination whether the mother's milk is normal or not, and his attention should always be called to any indigestion or lack of thriving on the part of the child. The marks of a well-fed baby are its plumpness, rosy color, good nature, easy and lively movements. good appetite. and sound sleep. When any one of these characteristics is notably absent, there is something wrong which demands a careful investigation. The decision on the part of the mother that she cannot nurse her child should never be made without the physician's approval. In general it may be said that when the mother is affected by any serious disease, such as consumption, puerperal fever, typhoid fever, and other serious troubles, that then she should not nurse her infant, but the decision not to nurse the child should not be made because she may have a sore nipple, or the child may give her pain at first upon nursing, and least of all because she dislikes the trouble and exertion which the care of her infant causes. Sore nipples can

almost always be cured by simple means which the doctor will direct. A child frequently gives the mother some pain upon beginning to nurse, seeming to bite the nipple, but this will grow less with time, and finally disappear; and when the mother realizes that a refusal to nurse her child means depriving it of eight out of ten of its chances for life, she may well hesitate before taking, or desiring to take, this step. When a child gives evidence of hunger, as if the mother's nourishment was insufficient, other food may be added at the physician's direction. The mother and nurse, however, must be sure first that the child is not thirsty, and the administration of water will easily settle this point. In the absence of a physician, boiled milk and water, half and half, may be prepared, warmed to a blood heat, and fed to the child by a teaspoon or from a carefully-cleansed bottle to which is attached a simple rubber nipple. If the mother be travelling, and good milk cannot be obtained, condensed milk will often bridge over the difficulty until she can arrive where proper milk can be had, but the administration of anything but mother's milk to an infant is a matter so serious as to demand a physician's attention.

The selection of a wet-nurse is also a matter for the physician only. It requires an experienced eye to detect in her marks of disease which might prove most injurious to the infant. The healthy wet-nurse is of course next best to the mother, but no task is more difficult than the selection of such a woman. Not only should she be of about the same age as the mother, her child of relatively the same age and development, her history give no evidence of disease or vice, but the physician himself must make a thorough examination to determine her physical fitness for this important trust.

It occasionally happens that an excessive flow of milk threatens the mother with inflammation of the breast through engorgement. This can usually be relieved by withdrawing, with a simple breast-pump, sufficient milk to relieve the distention. The free administration of saline laxatives, giving

the mother a diet which contains but little fluid, and limiting her diet somewhat, will often aid in checking the excessive flow. The breast-bandage already described is of the greatest utility in such cases. A scanty supply of milk may be reinforced by the careful selection of milk-producing articles of diet, as already described, by gentle rubbing, manipulation of the breast, and by perseverance in urging the child to nurse. Occasionally the infant will refuse the nipple; if then it be ascertained that the nipple is naturally formed, is not sore, and that the child's mouth is not deformed, a little milk may be drawn by a breast-pump and the nipple wet with the milk. The child, when then applied, will often grasp the nipple and nurse eagerly. The most easy and rational way of determining whether the child can nurse or not consists in putting the finger in its mouth. It is very rare for a child to be so deformed that the lips cannot grasp the nipple and make suction. Prematurely born and excessively weak children may fail from lack of muscular strength, but malformation is not common. Mothers frequently consult physicians for alleged tongue-tie in their infants. This, like deformity preventing nursing, is rare, and a little observation will generally convince the mother that the tongue can move freely. If the child can grasp the finger with the mouth, and the tongue can be felt applied upon the under surface of the finger, no serious tongue-tie exists. There are deformities in the upper jaw of the child, producing what is known as "cleft palate," which might cause difficulty in the child's nursing, but such deformities could not be recognized without the assistance of the physician.

PART II.

CHILD.

BY

J. M. KEATING, M.D., LL.D.

CHAPTER XXIV.

CARE OF NEW-BORN INFANT.

It is not necessary to dwell very long on the care of the infant immediately after its birth; that matter devolves entirely upon the doctor and the nurse. But there are a great many things that a mother should know about her infant, and these we will endeavor to explain as simply as possible.

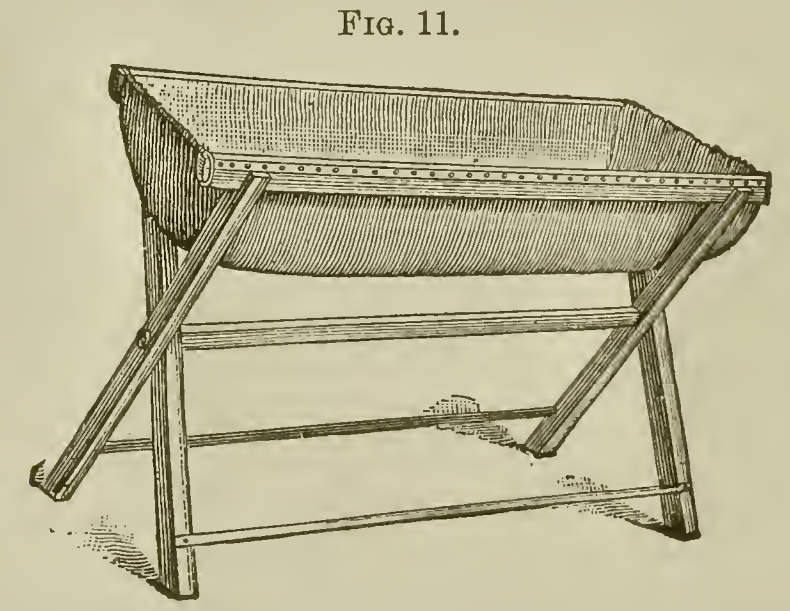
The child is commonly received from the hands of the physician in a soft, thick woollen blanket or cloth, which should be warmed before use. The child, when well wrapped, may be laid aside in a warm place until the mother's needs have been attended to. If the nurse have an opportunity, it is well for her to anoint the child's body thoroughly with some simple ointment which will assist greatly in removing what is known as the *vernix caseosa*, a cheese-like substance which covers the skin. A misapprehension commonly exists that the new-born infant needs a plentiful supply of fresh air at once. Respiration begins a very few moments after birth, but the child will obtain sufficient air if it be entirely but loosely wrapped in a coarsely-woven woollen blanket. The head may be covered without fear that the child will suffocate, for its lungs are but partially expanded, and its respiratory power is often not fully developed until some time after birth.

It is important that the child be protected from draughts of cold air, and that its eyes be spared the irritation of strong light; hence the folly of keeping the child's head exposed so that it may breathe, and of carrying it to a door or window to look at it immediately after birth.

Before giving the bath, its clothing should be selected and placed in front of the fire to become thoroughly warmed. In

large bedrooms a folding screen is of great service, and may be placed about the nurse and the basin or tub in which the child is bathed. It will thus protect the child from draughts and allow free ventilation for the mother. The temperature of the water should not be less than 100° F., and the soap used white Castile or spermaceti (Fig. 11). It should be remembered that two separate toilets of the child's body are to be made: that of the head and that of the trunk and extremities. Many toilet sets contain two washbowls and pitchers, large and small, and the smaller set is especially convenient to use in cleansing the child's face and head. It is important to do this separately, because poisonous material may be conveyed from the child's navel to the eyes or mouth. Accordingly, the head and face

Fig. 11.



A convenient folding bath. The tub of heavy rubber cloth.

should first be bathed, the head being well lathered with soap and the eyes flushed out with a solution of boracic acid (ten grains to the ounce); this is easily done by using a medicine-dropper; a bit of old handkerchief which has been carefully boiled may be dipped in the boracic solution, placed upon the tip of the little finger, and the child's mouth be thoroughly cleansed. The child may then be grasped with the palm of the left hand resting upon its back between the shoulders, the

fingers grasping the trunk, while the thighs are taken in the right hand. It should be lowered gently into the water up to the neck, and thoroughly but quickly bathed with a soft, new sponge or wash-cloth. Many nurses prefer a bathing-apron, consisting of a large, full apron of white flannel. The apron is so large that, as the nurse sits beside the baby's tub, a portion of the apron lays over her left arm, and may be used as a towel when the child is received upon her lap. After the bath the child should be powdered or anointed with simple ointment, dressed, and laid in its bed to sleep. It is well to give to the child, after the first bath, a teaspoonful of water which has been boiled and cooled, as it is not infrequently thirsty. An inquiry by anxious mothers and friends is often made as to how long the child can survive without nursing: it is even thought that within an hour after birth the child must obtain nourishment from the mother. It is well to put the child to the breast first when the mother wakes from her first nap. There is no danger in waiting for several hours until this rest has been obtained. The teas so frequently given new-born children by nurses are worse than useless, and should be positively forbidden. If the child cries and frets, and no other cause can be found for its restlessness, it should be laid upon its stomach across the nurse's knee, and water as hot as can be taken may be given to the child in teaspoonfuls, and, in addition, a little peppermint and hot water. Cáses are occasionally met with where nothing but a hot alcoholic stimulant seems efficient in controlling the spasmodic contractions of the intestines which cause what is known as "colic." Should the nipples be sore, nipple-shields should be employed. Of these the simplest are the best, as is true of all appliances and all articles to aid in the care of the child. The nipple should be bathed, after nursing, in a solution of boracic acid (ten grains to the ounce), to which has been added a little glycerin.

The child's mouth should also be cleansed, after each nursing, with a bit of soft, old linen dipped in the boracic solution

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employed for the nipple, carried thoroughly but gently over the mouth, gums, and tongue by the little finger. The first meal which the child obtains is a partially-formed milk, which acts as a laxative. Soon after birth the child commonly has a bowel movement which is of a peculiar dark, tarry color, and is called *meconium*. It sometimes resembles burnt molasses. The child should have several evacuations of this substance during the first day of its life, and *colostrum*, or material first obtained from the breast, is especially adapted to secure this result. Should this fail, a simple laxative may be necessary, such as a teaspoonful of syrup, or a little castor oil; but none should be given without the doctor's order.

The child, at birth, is covered with a waxy material, differing more or less in amount in different cases. It is said that in children who have very delicate skins the amount of this material is often greater than otherwise.

As it occupies every portion of the body, and can be removed by greasing the surface, the new-born child should be thoroughly anointed with either washed lard or vaseline, and then, with a soft sponge, tepid water, and a little Castile soap, given a superficial cleansing to remove as much as possible of the material. Unfortunately, many nurses believe that it is necessary that the babe should be made thoroughly clean at its first washing, and the poor little thing is rubbed and scrubbed in a most merciless manner.

If the birth has been a hard one, or the little one is feeble, it would be far better to postpone the thorough washing till the next day. The eyes, mouth, ears, and nostrils—in fact, all of the mucous surfaces—should be carefully washed with clean warm water applied by means of a clean sponge or piece of old linen.

This should be done after the cord has been severed. Indeed, it is now customary among many obstetricians to wash carefully the child's eyes the moment its head is born.

Usually the child's mouth, at birth, is full of a thick, viscid mucus, and its first cry will cause it to inspire this. As soon

as possible it should be turned over on its stomach, the head somewhat lowered, and the mouth thoroughly cleansed with a soft, wet rag.

The cord, which is the attachment between the child and the after-birth, contains the blood-vessels embedded in a gelatinous material more or less thick. As soon as the child is born and takes its first breath, the circulation in the blood-vessels of the cord gradually ceases.

It is not at all necessary that the cord of the child should be cut immediately after birth, nor should it be done until breathing has been fully established. The cord is usually grasped by the hands, and the jelly-like material within it squeezed with the fingers towards the mother; in this way compression of the blood-vessels takes place.

A ligature is placed tightly around it, about three inches from the child's surface, and another one about three inches from that towards the maternal parts; it is then cut with scissors between the two. After the child has received its first washing, the navel-string should be enveloped in a mass of sublimated absorbent cotton, folded up in a piece of linen, laid to one side, and then the child's binder placed about it.

The object of this binder is simply to give warmth and support the cord. Undoubtedly, if the navel-string were allowed to hang, be caught in the clothing, or be pulled about as the child receives its daily washing, a rupture might take place.

Undue stress has been laid upon the value of a binder to prevent rupture, and not half sufficient importance given to the binder as a protector in our changeable, treacherous climate. But it should be remembered that a misapplied binder is worse than none at all. It will, if applied tightly, produce rupture, undoubtedly, and will interfere with the intestines. We recall a case we once had: the babe screamed for hours, and the mother and nurse were almost distracted, but failed to find the cause. Upon being called, we found a tight belly-band which was acting like a vice around a flatulent belly.

Many physicians do not approve of a binder for either mother or child, and we must confess that if they are to be misapplied, we, also, would like to see them discarded altogether. There should always be ample room for the hand to be run between the binder and the skin, and the material used should always be soft and *very elastic* (Fig. 12).

Fig. 12.



Child wearing knit binder.

While the child is being washed and dressed it is well to secure deep and full respirations. It is said by old nurses that a crying child at birth has stronger lungs afterwards.

If, also, it is turned over on its stomach, with head lower than the rest of its body during the process of washing, the mucus will not be drawn in during inspiration, and a healthy inflation of the lungs will take place. As soon as possible the mother and child should get some sleep. After several hours' sleep the child can be again washed, if necessary, or sponged off; and this time it should be much more thoroughly done.

The circulation will be more thoroughly established, and the skin will assume the delicate, soft, red appearance of health. Extended experience has convinced us that for the first few days a little vaseline or cocoa-butter is better to use on the child after its bath than the dry powders heretofore in vogue.

It needs but very slight greasing of the surface to make the skin soft and pliable and to prevent eruptions; and when it becomes necessary to use a powder for dusting to prevent chafing, the non-scented talcum is decidedly the best; indeed, the only kind to use.

The child's clothing should have two important qualifications: it should be warm and absolutely loose over all parts of the body.

After the child has had its first nap, attention should be paid to its secretions. If the bowels have been moved, use vaseline instead of water for its washing; if it has not passed its water, call the doctor's attention to it at his next visit: this is an important matter.

CHAPTER XXV.

CHILD'S NAVEL—APPLICATION TO THE BREAST—WET-NURSES.

In the care of the child, and closely associated with what we have described under the head of antiseptic precautions for the mother, is the care of the child's umbilicus. As a rule, when the umbilical cord is cut, a stump or remnant from two to three inches long is left, requiring attention for from five to ten days. The dropping off of this cord usually occurs, by process of drying, between the fourth and sixth day. The umbilicus is left oftentimes in a state of soreness which requires attention. This sore may be contaminated by septic poison just as any wound upon the mother may be found infected, and hence it should be dressed with some antiseptic dressing. The better way is to buy at the druggist's some antiseptic gauze, saturated with bichloride of mercury or boracic acid. Cotton impregnated with these substances is often preferable. At each dressing of the child, the stump of the umbilical cord should be carefully enveloped in such gauze or cotton, laid upon the child's left side, and over it should be placed a knit abdominal band or flannel binder. This has already been described, and need not be repeated here. At the time of bathing, the cotton should be cautiously removed and replaced. Care should be taken not to make traction upon the cord, and in a few days it will have loosened and come away.

After the expulsion of the meconium,—the burnt-molasses-like substance, to which reference has been made,—the healthy child has usually two to four stools in the twenty-four hours. They should be bright yellow in color, in consistence varying from thinly-boiled to semi-solid corn-meal mush. The functions of the kidneys are also early established in the child, and the diaper will require changing a number of times during the first and second days. The urine is often almost free from color, and hence the delusion which exists in the minds of many mothers and nurses, that this urine does not contain the usual substances in solution, and that the diaper wet with it does not require washing, but simply drying before being used again. Nothing can excuse the uncleanliness and filth of such a practice, and the child's diaper from its first hours of life should not be worn a second time unless it has been thoroughly washed and dried. It is possible that some cheap absorbent paper may be found which can be used for this purpose, and can be burned when soiled. If the child does not pass urine freely, simple means may be taken to secure its expulsion: placing the child in a warm bath; laying upon the abdomen a flannel wrung out in hot water and sprinkled with a few drops of spirits of turpentine; holding the child with its naked back exposed to the heat of an open fire or stove, so that decided warmth shall be felt. All of these expedients are harmless and in mild cases often efficient. A half-teaspoonful of sweet spirits of nitre in a little warm water will often bring about the desired result.

It will be noted that the navel-string will come away in four or five days without any offensive odor whatever. The above method of dressing the cord is a convenient one, as it does not require to be touched after its first arrangement.

The navel should be kept absolutely dry, not the least grease being used near it; in this way there will be no odor and the remains of the cord will dry up and fall off. Should any odor be perceptible, the part can be dusted with boric acid or with a powder containing one-half boric acid and one-half talc.

As a rule, there is very little trouble from the navel, though possibly at times, if the child should become constipated, or have a severe cough, great straining may take place, when bulging or rupture ensues. This can be readily obviated by placing a small pad beneath the binder, not exerting great pressure; indeed, a binder which is too tight is more apt to cause a rupture than none at all.

Should there be any discharge from the navel, the nurse should make a careful examination of it when the child is being washed, and if a small ulceration is found, as is sometimes the case, it can be dusted with boric acid, and if the little red projection still remains, and there should be no doctor to call upon, it can be touched with bluestone and then dressed with benzoated oxide of zinc ointment.

It makes very little difference on which side the child lies after its birth. It is scarcely necessary to dwell to any great length upon the appearance of a healthy child at its birth.

The soft, peach-like character of its skin, the constant tendency to sleep, which is uninterrupted and quiet, associated with an air of repose, are well-known evidences of health. It is not necessary to dwell at length on the fact that the child at this age is a noted creature of habit; indeed, as we come to consider infants as they grow, and to study the many causes for that most distressing state of affairs, sleeplessness of infants, we can trace it back, I can almost say in one-half of the cases, to the unfortunate indiscretion in humoring the child when it is not more than a few weeks old.

The young mother feels that the cry of her child must naturally come from hunger; but as nature has failed to supply constant material for the fountain, she is often indiscreetly advised to substitute milk and water or a little catnip tea. Our own experience teaches us that this is wrong, and that the following procedure is the one to be recommended.

After the mother has rested thoroughly the child should be placed to her breast. Some children will immediately go

to work, knowing exactly what they have to do; others again may refuse absolutely to nurse.

Those that seem to know all about it will find it hard at first to obtain any nourishment. After many attempts, and succeeding only in extracting what is known as colostrum, a laxative secretion which precedes the milk-flow, they will from sheer exhaustion give up the attempt and fall asleep.

Infants that refuse the breast cry and fret. To these it may be well to give a linen rag moistened in water to suck, or a little water with a spoon, and then at a regular definite interval, say an hour, place them once more to the breast until they become used to it.

There is no danger, under any circumstances, of a child starving to death; for several hours, at least, it can exist without food, and needs only a little water; and then, if it is placed during the next twenty-four hours, in daytime, every hour to the breast, and after that regularly every two hours, by the time the flow of milk is thoroughly established the child will have its little programme laid down for it, from which it must not deviate under any circumstances. If it becomes absolutely necessary to feed the child, condensed milk, one teaspoonful to twelve or fifteen of boiled water, is to be preferred.

Mothers and nurses should recognize the fact that the habits which a child acquires in its first few days of existence are very hard to break. If it be spoon-fed, it will be difficult to make it take the nipple; if it be bottle-fed with rubber nipple, it will be difficult to get it to nurse its mother.

Then, again, the taste of cow's milk, however carefully it be prepared so as to resemble breast milk, will often cause it to refuse to nurse. Often the nipples are so tender or the suction will so affect the nursing woman as to restrain the milk-flow, and the child will nurse in vain, while the mother will suffer such torture that nursing will be abandoned and the child be hand-fed.

A glass nipple-shield will frequently obviate the difficulties, or, by gentle pressure and coaxing, sufficient milk can be

taken from the mother to spoon-feed the babe until nursing can be gradually accomplished. We have been so much im pressed with the importance of a healthy mother nursing her child that we believe in temporizing as much as possible to secure this end.

For about two or three weeks the child should be nursed every two hours day and night, and during the periods of intermission both the mother and child should sleep as much as possible. It is understood that the child should nurse at each breast alternately. This is an important matter, because a child would soon get accustomed to one breast and refuse the other, and this leads to incalculable suffering. After the child is nursed the nipple should be washed with a little plain water or soda, or borax and water, and greased with some vaseline.

The flow of milk generally begins on the third day. This flow may come on suddenly.

There seems to be a rush of milk to the breasts. Indeed, this is usually the way the milk comes at each nursing.

Frequently the woman will have no evidence of milk whatever, when, at the hour at which her child usually nurses, or even at emotion or thought of her child alone, the flow of milk will take place. This is especially the case with those who have had children before.

These women sometimes make the very best wet-nurses.

WET-NURSES.

It sometimes, as we all know, becomes necessary to decide on very short notice the question of having a wet-nurse. We will not go deeply into this matter, because the circumstances of each case so group themselves as to bring the answer without consulting a book. The age of the child, the financial condition of the family, the residence, are all to be taken into consideration.

The wet-nurse should, preferably, have had other children; her child should be about the age of the one she is to nurse; she should be a perfectly healthy woman; her child should

also be seen, be thoroughly examined, and should give all the evidences of perfect health. First of all, the family record should be investigated.

Did her father, mother, sisters, or brothers die of consumption, cancer, scrofula?

If she has had other children, were they strong and healthy? Did they thrive upon her milk?

If they died, of what did they die? The physical condition of a wet-nurse is as important, of course, as her family record. She should have no constitutional disease of any kind; her lungs should be healthy; her skin should be clean, free from any eruption, or the remains of one; her teeth should be good, which is an evidence of good digestion; her eyes bright, her muscles firm and well formed; she should have no loss of hair, sore throat, or chronic nasal catarrh, and her breasts should be well formed. Then comes the question of temper, and indeed, as regards this, it is as hard to get satisfactory testimony as it is for the physical condition.

She should be pleasant in disposition, not stupid; energetic, willing, devoid of high temper, and possessed of those traits which will soon endear the child to her. Such a nurse would probably give about two quarts of milk in twenty-four hours.

Of course, much of this examination is made by the family physician, who is the one to decide whether the nurse is suitable or not; but there are times in cases of emergency, when the mother, or monthly nurse, has to decide. On that account we have dwelt at length on this subject.

The nurse's child should be plump, well formed, free from any eruption. Its odor should be sweet and fresh, not sour; should it vomit, the material should be simply the overloading of the stomach and not sour milk. A healthy baby will often take more than its stomach will hold, especially if the mother's milk is plentiful and flows freely.

Having, then, decided upon the health of the wet-nurse and on the chances that her milk will be plentiful, she should be questioned carefully about her supply of milk. The question

as to the employment of a wet-nurse is one with so many phases that in a work of this sort it cannot be answered by "yes" or "no."

Dr. A. Jacobi, writing of the diet of wet-nurses, expresses himself as follows:

"Powerful salts are to be avoided under all circumstances, as well the salines as the more powerful drastics, likewise an injudicious use of table salt, ethereal oils, and strong condiments. Furthermore, everything is to be avoided, whether of substances taken into the stomach or improper habits, which have a tendency to derange or to weaken digestion and assimilation. Generally the wet-nurse looks upon her position as one would regard 'a land which flows with milk and honey,' and where 'roasted pigeons fly into the mouth,'—Canaan and America at once,—and where there is no end of things to eat until the appetite is satisfied or spoiled. Somewhat more of albuminous food is indicated than under ordinary circumstances. Too much of this, or a diet composed exclusively of it, would destroy health and the milk-secreting power as well. Much fluid food and an abundance of water will increase the volume of the milk. Water and barley gruel act upon the milk as well by virtue of the water which they contain as by their nutritious qualities, and the same is true of tea in moderate quantities. Potatoes, in large quantity, and other carbohydrates are to be avoided as a principal means of nourishment. Fat in moderate amount is desirable. In general it may be laid down as a fundamental principle that a wet-nurse will have the largest quantity and the best kind of milk when using the same nutriment to which she was accustomed before pregnancy, provided it kept her in good physical condition, with the addition of a certain quantity of albuminoids and plenty of fluid food. What the nursing woman spends in the shape of milk must be returned to her. Where we are dealing with small, atrophied breasts, and it is necessary to stimulate the secreting function, considerable time is required before a free and satisfactory flow of milk can be obtained. If

we are looking simply to keeping up an abundant supply, carbohydrates may prove satisfactory. The most common question, however, is in regard to the improvement of the substance of the mammary glands themselves. It must not be forgotten that tissue-changes and good health do not depend alone upon what is eaten. A wet-nurse must not be thrown too suddenly upon conditions which are quite strange to her. She must live, as nearly as possible, in the manner to which she has been accustomed. A nurse who is removed from the hay-field or the kitchen-table to the boudoir of a lady, and who is held in restraint from fear lest she might eat a raw apple, or drink a glass of beer, or meet her lover, or who is deprived of her customary physical exercise, will not remain healthy nor give a proper quality of milk. In accordance with these fundamental directions, the various articles must be criticised which have been recommended as proper means of nourishment and diet during the period of lactation. The list of such articles contains beer (?), buttermilk, milk, chocolate, thick soups, husked grains, oysters, crabs, sea-eel soup, etc. If all these dietetic means do not accomplish their end, one has to look around for therapeutic measures for the stimulation of the milk-secreting function, with more or less of reason and more or less of confidence."

If the question be asked, Can a babe be brought up without the wet-nurse, depending upon the bottle alone? we will say "yes;" but so careful must be this bringing up, so vigilant the nurse or care-taker, so conscientious, so scrupulous in attention to details, that one almost feels like saying that if a wet-nurse can be obtained who fulfils all the above requirements,—who is healthy, docile, and of an affectionate disposition, intelligent, and one especially who has lost her babe and takes the new one to her heart in its place,—secure her by all means. In times of illness, there are occasions when a wet-nurse seems to be, for a time at least, a necessity.

One objection which is frequently raised by mothers is that they do not like to see their babe nursed by other women. This may be valid when the balance is equally divided between

the wet-nurse and the bottle, but where the babe is delicate, where a strong hereditary taint is present, and the chances for the child's future health would be made greater by the nourishment it would receive from a strong, healthy woman, this objection should have no weight whatever. The mother who really cares for the future of her offspring will cast aside such feelings and gladly see her child get a start in life that will enable it to compete with others in the struggle for existence. Indeed, the condition of her own baby will be evidence in itself. There are other matters to be taken into consideration.

The nurse's child will have to be taken by some one who will give it care, so that her mind may be entirely relieved on that score, as anxiety and fretting may cause her to lose all her milk in a short time. It must be remembered that she comes from a class who, as a rule, are accustomed to much out-door life, very plain diet, and regular habits, and that a sudden change to a life of luxury, variety in cooking, and over-stimulating food is apt to bring about a condition of biliousness, laziness, and irritability of temper which is difficult indeed to regulate.

We have frequently known the very best of wet-nurses, who have given satisfaction for a month or so, suddenly, without any apparent cause, lose all their milk, and in such cases the whole trouble of selection, together with the risk of getting a milk which disagrees with the child, has to be gone over. Indeed, if under such circumstances the woman proves herself to be reliable and affectionate, it is often far better to put the child upon the bottle and keep her as ordinary nurse.

When the question comes up for decision between a wet-nurse and bottle-feeding, we should bear in mind that the child who is to be subject to city influences should be wet-nursed, especially during the hot summer months. We believe that bottle-feeding, which, as we shall see further on, requires the greatest amount of care and watchfulness, is successful in many cases, but the more we see of it the more we are satisfied that every child, if possible, should receive breast-milk

until it is four months old; at least this is imperative for a city child.

Of course, when a child is delicate, or where there is an inherited taint in the family, such as consumption, or the family is known as a delicate one, wet-nursing becomes all the more important.

The choice of the wet-nurse, when possible, should always be left to the family physician; indeed, a doctor's examination of her milk and her baby should always be obtained.

The system recently established at the nurses' directories in our large cities, of having certified wet-nurses, is a very valuable step forward, and should be encouraged by the public.

CHAPTER XXVI.

CARE OF THE BRAIN AND NERVOUS SYSTEM.

So far as the child's mind is concerned, the fond delusion which mothers commonly cherish, that children perceive and recognize as soon as born, or soon after birth, must be disregarded. It is probably not before the third or fourth month of infancy that the human being perceives. By this we mean that while rays of light may fall upon the child's eyes, and waves of sound may strike its ears, and sensations of cold or warmth or roughness or smoothness be excited in its skin, and while sound may be heard as a confused noise, yet the child has no idea as to the meaning, source, or character of these sensations. It seeks its mother as any other young animal seeks its natural source of food; but perception, will, like or dislike, other than the animal desires for food, warmth, quiet, and muscular movements are undoubtedly absent. The child, then, should be treated as a precious but very prosaic little animal, and while imagination and affection may detect elo-

quence in its cries for food, and rejoice in caresses which are largely involuntary, and sympathize with lamentations which contain no prophecy except a warning that the stomach is empty, all of these manifestations should be taken in the most matter-of-fact way. If a vase is to be made by a potter, the mass of clay is first prepared, and then the rude shape is turned upon the wheel. It is only by repeated applications of the hand and the potter's tools that a design becomes apparent and the shape takes meaning. The infant resembles at birth an organism whose general form is complete, whose design may easily be inferred, but which utterly lacks details and connected manifestations. It requires the many little touches given by the different sights, sounds, and impressions which the child receives to mould it into an intelligent being, and this process cannot be accomplished to any extent before the period which we have mentioned. This disquisition on mental philosophy is not introduced to rob the mother of delight in her offspring, but to allay her anxieties and enable her to lay aside worries which otherwise would injure herself and her child. If babies were exhibited more as kittens are,—as objects to be looked at, admired, but let alone except by the mother and nurse,—the babies would be more comfortable and their mothers likewise. If it be true that the child does not perceive until three or four months old, it is also true, however, that habits can be formed from the day of birth. It is therefore of the greatest importance that quiet, regularity, and strict discipline should be the atmosphere of the child's first months of life; the object being to form a solid physical background for the development of its nervous system, this process should not be interrupted, and the greatest regularity, the kindest but most efficient care should be given not only that it be regularly fed, but that it be fully protected from useless disturbance. Any one who has watched in a public conveyance a fretting, restless baby trying to sleep, while an ignorant mother or the confusion about it prevented its slumber, will recognize a species of physical unhappiness which is very near frenzy. If the child must be taken in

public conveyances, it should be done in the most careful and judicious way. The introduction of sterilized milk has made it possible to take an infant upon a journey, maintaining the regularity of its hours of feeding with the utmost nicety. Possibly the time will come when the luxurious trains, which now offer the conveniences of a good hotel, will contain cars adapted for the transportation of women and infants, where sterilized milk can be easily warmed, where a mother and her infant and nurse can occupy their own apartment, and the miseries of infant travel be almost removed. It is a familiar fact that a child no older than six months can travel with very little annoyance to itself and its attendants, if the prerequisites—warmth, quiet, food, and sleep—be scrupulously maintained. The very fact that the infant ordinarily notices its surroundings very little, makes its transportation comparatively easy. There is no reason why these simple prerequisites should not be placed within the reach of the poor. In several countries of Europe nobility has interested itself in establishing depots where sterilized milk can be obtained at the lowest possible cost by peasant families. Similar movements are on foot in this country, and we trust that the time will soon arrive when sterilized milk, and any other food which science can prove to be essential for infants, may be obtainable at or near our great railway stations. Of course, a nursing child needs only its mother's food, but the mother should receive the same consideration as is shown the child, and thus her nourishment will remain uninjured by fatigue or deprivation.

CHAPTER XXVII.

THE NURSING OF INFANTS.

We have elsewhere written[1] as follows, when on the subject of nursing:

How much food does a babe require in twenty-four hours? Much depends on the infant: if the bowels be normal and there is no evidence of indigestion, the breath sweet, and the child seems desirous for more after it has finished its bottle, there is no reason why it should not be satisfied.

From birth until it is a month old a babe should be nursed every two hours; it will take one ounce or a little less at each feeding. There is one matter of great importance, and that is, the child should be made to nurse from both breasts from its birth, alternating at each nursing.

It is strange that an infant nearly always shows a preference for one breast, and there may be a struggle to conquer this; nevertheless, the battle must be fought, or the neglected breast will give much trouble.

Dr. Jacobi says, "The child ought to drink from the breast or the bottle until it has had enough. It takes twenty to twenty-five minutes to empty one or both breasts. After having nursed, the infant should be quiet, should play with its arms, should breathe somewhat more regularly than usual, or go to sleep. If it be not allowed to have absolute rest, if it be rocked, allowed to lie on its belly, or be carried around, lying face downward upon the hand of the person carrying it, vomiting will be provoked. The facts which have been introduced show that nature requires *play-room;* even the most careful measurements may be incorrect."

A child a month old should be nursed about ten times in

[1] Annals of Hygiene, July 1, 1886.

twenty-four hours,—every two hours during the day and three hours during the night; at each nursing it should take from two to three ounces of milk. At the age of three months it will probably nurse only about eight times, taking some six ounces at each feeding; at the end of six months it will take about eight ounces.

We believe that the above represents about the amount of breast-milk that a very robust child would receive, though Dr. Rotch makes the estimate a little less.

The child gets the same food as does an adult,—that is to say, the milk which forms its diet is composed of all the articles of food that enter into the diet required by a human being. These may be divided into five classes: *water*, *caseine* (curds) or albuminoids, *salts*, which go to the formation of bones and secretions, *fats* and *sugar*, which are burned up to make animal heat, and are also valuable in nutrition. Eighty-seven parts of a child's food is water, but then we know that seventy per cent. of the human body-weight is water.

Mother's milk is a bland, watery substance, sweetish to the taste, and has the property of forming curds in flakes; whereas the milk of the cow precipitates in heavy masses, as a rule, and is on that account difficult of digestion.

A healthy infant, if properly instructed in the earlier hours of its life, will awaken with the regularity of clock-work and seek its meal every second hour. It should be placed at the breasts alternately, and after it has received its nourishment it will probably fall asleep, showing no evidence of indigestion or flatulence, so frequent in bottle-fed children. Babies are very apt to get into the bad habit of falling asleep after taking two or three mouthfuls. Should this habit be encouraged, it will be very difficult to break. The child should be promptly awakened and made to continue the meal until it has taken a sufficient amount.

At the third month a child should nurse about every three hours, or possibly, if it is a large child, craves food, and takes a great deal at once, every two hours during the day and at

longer intervals at night. If the mother has a very free flow of milk,—more, indeed, than she can possibly retain,—it is well for her to wear the ordinary disk or cracker-shaped nipple-glass during the daytime, with a towel pinned over it, which will absorb the surplus milk, and will prevent her being constantly wet and catching cold. As can be readily understood, the breasts of a nursing woman demand constant attention. The nipples being of various shapes, there is often a singular want of compatibility between them and the infant. Often a nipple will be so small that the child cannot grasp it readily, and in its great impatience it will fail to effect any suction whatever; then, again, the nipple will be too large a mouthful, and a free flow of milk will almost choke the child. These conditions can be regulated by the mother grasping the nipple between two fingers (index and second) of the unoccupied hand, and either making gentle pressure to increase the flow or restraining the current by slightly squeezing the nipple at its base. Some nipples are sunken in, and it is impossible to keep them sufficiently raised to allow the babe to grasp them or to prevent chafing and cracking at their base. It is wrong to attempt to harden them by astringents; they should be kept clean, free from any acidity, dry, soft, and pliable. They should be sponged off with a weak solution of boric acid in water after each nursing, and then thoroughly dried and the base anointed with a non-irritating salve,—something that will not be disagreeable in taste or odor to the child. White vaseline or cocoa butter is as useful as anything; the latter can be rubbed up with a little glycerin to make it softer, if necessary. There is an excellent old-fashioned salve, known as "Pomade Divine," described in many old English books. It is made of wax, suet, herbs, etc., and no better ointment of a soothing, healing character can be found. Many people keep it to put on bruises.

Some mothers suffer the most intense agony, at first, when their babes nurse; they become nervous, and the very thought

of it puts them into such a nervous state as either to entirely stop the milk-flow or certainly to make the milk disagree. When this is the case a glass shield with rubber nipple will be of service, for a few days at least, until they become accustomed to the suction. Breast-pumps should never be employed unless ordered by the doctor, and then only under the supervision or direction of a trained nurse.

What should be done if the breasts cake or become tense? If the flow comes very quickly this is apt to occur when the demand of the child is not equal to the supply. To prevent this, and to relieve it when it takes place, there is nothing better than gentle but firm stroking of the breasts from their margins towards the nipple. Hot lard is the best thing to use for this. Some nurses have a special knack of relieving engorged breasts in this way. The breasts should be supported by a suspensory bandage: a soft towel, folded bias, passed beneath the breast and arm and tied behind the neck, or a silk handkerchief, is the best thing to use for this. Nursing women should be most careful not to get chilled; although possibly breast abscesses are more apt to follow sore nipples and bruises, they may result from cold, and are indeed most serious things. Sleep and exercise, ease of mind,—a contented disposition,—are of great importance to a nursing mother; fresh air and good food stimulate the appetite and make good milk. A daily sponging of the body, or a bath, makes the skin do its share of work and keeps the other organs in good working order also; in a sleeping room, fresh air *without draught* is essential. If these things are necessary for the mother, they are equally, if not more, so for the wet-nurse, and the mother must see that they are attended to.

Colic is so frequent in nursing as well as bottle-fed babes that it is not out of place to consider it here, though when writing on bottle-feeding we will dwell more at length upon it.

What a mother wants to know is how to distinguish the various causes of colic, so that she may properly apply those domestic remedies that will relieve it. Frequently

a babe will be seized with severe pain at the first attempt to nurse; it will suddenly scream, draw its legs up, and refuse the breast. If this were due to flatulency, the belly would be round and tense. It is the result of what is called reflex action or stimulation transmitted from one set of nerves to another; the intestinal canal is set in motion and its nervous centres are stimulated by the act of sucking, just as the sight of food makes an animal's mouth water. There ought to be a rule that, whenever a babe screams suddenly, with evidence of acute pain, all its clothing should be removed to search for erring pins or too great pressure. Earache is a frequent cause of acute pain in babes, and is often overlooked, but it is most common in infants of over three months, and it would be well for the mother to send for her doctor should the child not be relieved by the measures intended to check intestinal colic; he may be able to locate the pain elsewhere and suggest appropriate measures.

The presence of food in the stomach and intestines will often induce colic, until the digestive processes are fairly established. That is one reason why it is desirable to allow the child to nurse at regular intervals only, and to apply it early to the breast, while the mother's milk is scanty. The early secretion from the mother's breast has a somewhat laxative effect, and probably is intended to act as such in order to purge the babe's intestinal canal of the accumulations that have taken place during its fœtal life. If the babe has colic following the first attempt at nursing, it is often advisable to give it a teaspoonful of olive oil in a teaspoonful of warm liquid "soda mint" before nursing, and to draw from the mother the first secretions. Another cause of colic is overloading of the stomach and intestines. Some babes evince a greediness which is remarkable, or the flow of milk may be totally beyond their storage capacity, and from bulk alone promote pain. Again, fermentation may take place very rapidly. Some babes regurgitate the milk very readily, and thus the bowels do not suffer from distention by the gases

of decomposition. Mothers often complain of this and fail to see that it is nature's safety-valve; indeed, it is only the excess of food that is got rid of in this way. A babe can digest only a certain amount and no more; the amount that can be digested differs with every infant. *It is not the amount of food a babe takes into the stomach, but the amount it digests, that does it good:* this must never be forgotten. One often sees a babe crying from colic, and the nurse or mother attempting in vain to soothe it by dancing it up and down or by singing a lullaby! Imagine the torture to the poor little one from such a proceeding! Unless a vent for the wind be found the crying will continue, and the wonder is that convulsions do not oftener occur. When a child, then, has colic, do not nurse it; unclothe it, give it a warm drink by the spoonful,—catnip tea, liquid soda mint (some advise gin and water, but, as a rule, we are opposed to any stimulants in such cases unless ordered by the doctor). Rub the abdomen very gently from right to left with some warm olive oil, or, what is still better, let the child lie face downward on the lap and gently rub its back with some warm liniment, or even the bare hand. If it still continues to cry, give an enema of a teaspoonful of tincture of assafœtida in two ounces of water, introduced very gently; and if the pain still continues after the enema has acted, put the feet in hot water, tested first by the mother's arm that it may not burn. Should this fail, send for the doctor.

The strictest attention should be paid to the clothing of a babe; not infrequently colic may be caused by cold, especially cold feet. Sometimes a babe will seize the breast with avidity, give a few attempts at sucking, apparently choke on the milk, and cry. This may be caused by cold in its head, the mucus stopping the nose so that it is impossible for it to breathe and suck at the same time. The doctor's attention should always be called to the babe's nose if it has sniffles, or if it breathes noisily or with difficulty, that he may use appropriate measuaes to clear out the nasal passages. The nurse should take care, when washing the child, and especially in cold weather,

that it be not in a draught. I have often seen a faithful nurse bathing a babe in a stifling hot nursery, near the fire probably, and the constant opening and shutting of an adjacent door supplying a direct draught to the child. In my experience, nasal catarrhs are very common with infants.

In choosing a wet-nurse it is, perhaps, better to select one who does not menstruate. Not that ordinarily normal menstruation will affect a nursing babe after it is three or four months old; but excessive menstruation will act as a drain upon a woman and certainly affect her milk. Matrimonial intercourse need not, either, interfere with nursing, provided it is indulged in with caution and in moderation; but great watchfulness must be exercised over wet-nurses in this matter, coming as they frequently do from a class not over-particular in morals, unless one is fortunate enough to secure a married woman. Wet-nurses are liable to excesses, and these will have a very baneful effect upon a delicate child; indeed, this and intemperance is a risk always run. The child being healthy, it may be well to gradually enlarge its bill of fare as it grows older, in order to accustom it to a change in diet, or to prepare for any change that may become necessary. It has been said that a child digests bottle-food when it also takes breast-milk, and therefore that weaning should be a gradual process,—so gradual, indeed, as to take several months for its accomplishment. When it is deemed desirable to substitute it for breast-milk, the bottle should be given in the daytime, after the morning bath; or better still, if the nurse has the child, to give it the breast in daytime, so that the mother may get her night's rest. By this time the child takes, as we have noted, more food at each nursing and nurses less frequently, and now it may have the bottle at about ten or eleven o'clock at night, when the mother retires; in this way she can nurse the child at the early morning hour, and thus avoid the exposure of getting up and preparing a bottle of food at that hour, if she takes charge of the child herself.

CHAPTER XXVIII.

BOTTLE-FEEDING.

If we have impressed sufficiently upon the reader the importance of care in the selection of a wet-nurse, we did not do so with the object of undervaluing the subject of bottle-feeding by contrast, although there is no question but that the valuable suggestions, the outgrowth of careful study, that have been published by such writers as Leeds, Smith, Meigs, Jacobi, Rotch, and others in this country have impressed upon the community the fact that the raising of children by means of the bottle is by no means as difficult a matter as it was thought even ten years ago. They have all premised their teachings by impressing the fact that *care* is the primary step to success. If it is a difficult matter to keep a wet-nurse in order, it is no less difficult to give the requisite attention to each bottle. *One bottle of tainted milk may be fatal to an infant*, and though a mother or nurse may day after day watch with the most zealous care the preparation of the baby's food, the souring of the milk, its admixture with contaminated water, the change of pasture of the cow, may bring on an attack of diarrhœa or vomiting which would be uncontrollable. We wish, therefore, to impress upon all those who have anything to do with the bottle-feeding of children that a child, not exposed to the dangers of a large city in the summer-time, can be brought up on the bottle from the day of its birth and be free from disease, become strong and healthy, *provided the same attention is given to it as would be given by a mother to her new-born nursing babe.* At the same time, we believe that every mother should be impressed with the fact that no form of bottle-feeding, however perfect it may be, and however closely it may resemble breast-milk, can take the place of breast-milk for a child under three months of age. Breast-

milk is the ideal infant's food, and if we dwell at length upon bottle-feeding, we do not for a moment wish it understood that we undervalue the milk of the mother or, next to it, that of a reliable wet-nurse.

The first requisite for carrying out bottle-feeding with thoroughness is that somebody should take charge of the child who has a special interest in it. If we are talking to a young mother whose milk has given out, or whom the family physician has advised to bottle-feed her child, then *she* is the one to undertake the work, and either to prepare each bottle or to superintend its preparation for a time at least. Possibly she has had a wet-nurse whose milk has gone, and it has been decided to use a bottle instead of procuring another. Then let that nurse undertake the duties. She has a special interest in the child who has drawn its nourishment from her breast. If not, then get some middle-aged woman, not too old or cranky, or over-burdened by previous experience, but never a small chit of a girl who would require a nurse to look after her. Strange to say, these latter are often engaged as child-nurses, and no wonder the doctors are kept busy. Choose a middle-aged woman, or a strong, healthy young woman of intelligence,—one who is bright, cheerful, satisfied. Make your pecuniary arrangements with her perfectly satisfactory, so that she has nothing whatever on her mind. After you have tested her ability, give her your entire confidence; let her see that she is trusted. It is well that the child and nurse should have a room to themselves near to the mother's bedroom, and this room should have in it two things of great importance: one, a small sick-room refrigerator; the other, a gas-lamp or something by which the milk or water can be readily heated. It is necessary to have a half-dozen nursing-bottles holding about eight ounces each. A child a month old will take not quite one-quarter of this at each nursing. At the age of six months it should take at one feeding about six ounces. As there is more danger of decomposition from cow's milk, it is wiser to give an infant less bottle- than it would get breast-milk at the same age; but as the

capacity of a babe's stomach is in proportion to the weight of the child, a feeble babe needs less food, but the intervals of its nursing may be made somewhat shorter; an extra bottle may be given at night. *Overfeeding is a great cause of diarrhœa.* Most mothers overfeed their bottle-fed babies: it is a temptation hard to resist; but the lesson is frequently a bitter one. It is far better to underfeed for a time, and let the doctor regulate the increasing diet, which he can gauge by the child's weight. A gain in weight and a healthy condition of the passages is the test of the amount of food a babe should receive. The average healthy babe may gain by proper food from *a half* to *one ounce* a day in weight for the first *four* or *five* months, and half that amount daily for the rest of the year. The question as to whether a woman becoming pregnant should continue to nurse her child is one to be left to the family physician to answer.

The fresher the milk the more readily it will be digested; indeed, we feel satisfied that the warm milk, just from the cow, is far more digestible than that which has been kept with every precaution for a few hours. There must be some change which milk undergoes, as it is noted by all observers that the milk when warm from the cow is but slightly acid, or neutral, by litmus paper, but after it has stood for a while it always shows a very decided acid change. Mother's milk is always slightly alkaline.

The greater part of the secret of success in bottle-feeding is to have pure, fresh milk; and we would say beforehand that if there is the least doubt of the character of the milk served, there should be no hesitation about putting the child at once upon condensed milk until this matter is thoroughly investigated; though it must be remembered that the condensed milk *must be either sterilized* or *treated with boiling water*, as will be described later, just the same as would be cow's milk. Although one may be most careful in the selection of a milkman, in the city, yet the jolting that the milk gets in transit, the risk that is run from diseased cows, dirty cans, contaminated water in

milk-houses, is by no means small, and especially during the heated season, when the child's intestinal tract is weakened. These causes of bad milk are followed by disease; possibly this accounts for the fact that milk from the same dairy that has agreed perfectly during the spring months will sometimes disagree with the child in summer.

So much attention has been paid to this matter recently that the public has become interested in the establishment of dairies where every precaution is taken to secure the very best of milk by legislative interference. The pasture and winter-feeding should be regulated; the health of the cattle, the methods of preserving the milk, and its transportation looked after; the milk-inspectors should be on the alert to prevent the introduction of such substances as boracic acid or salicylic acid to preserve the milk.

Great care should be taken in the selection of milk, and in its preservation, even after it has reached the house, until used. The milk should always be tested with litmus; if it is alkaline, it has been made so by the addition of some preservative. Cow's milk always presents to litmus paper more or less acid reaction, turning the litmus red. If there is the slightest suspicion that the milk has been watered, is not very fresh, or that it has been subjected to much jolting, our opinion is that it should be boiled at once and then put in a refrigerator, and warmed for each bottle. The boiling will destroy its ferments, and in that way diminish the chances for intestinal disturbances; but boiling will not make milk sweet that has been *turned* or make fresh that which is stale.

The propriety of obtaining milk from a single cow is one that has been frequently insisted upon, and if one is satisfied that such milk is obtained and is found to have agreed with the child, it may have many advantages; but we think that the ordinary mixed milk from a dairy of common cattle will be less liable to daily changes; it will maintain, as it were, an average. Not only should the milk be pure and sweet, but it should be free from all matters that carry disease with them. Our medical

literature contains very many authentic cases of scarlet fever, typhoid fever, and diphtheria which were undoubtedly carried from the dairy by means of the milk, the farmer's family suffering at the time from the disease in question. If, for instance, the water of the milk-house should be contaminated by an outhouse well, and the washing of the pans convey these materials to the milk, the result, of course, would be apparent; indeed, milk is undoubtedly frequently diluted, and the water will carry the germs with it. Milk also has the propensity of absorbing odors and gases that probably contain the germs of disease. Milk also may contain the germs of disease affecting the cow herself: so we see that there is a great risk to be run, and be we ever so careful and watchful we can only avoid the most apparent evils, and will have to trust to Providence to save us from the others.

If each householder was more particular about his milk, gave it the strictest watching, and if the laws in regard to that *outrageous and most criminal proceeding, the adulteration or dilution of milk*, were rigidly enforced, dairymen would soon feel the importance of obtaining and sustaining a reputation for honesty. It is a very difficult matter to reach the legislators of the land, those who make its laws; but possibly, by placing these matters in a clear light before their wives, they will be made to see the criminality of adulteration of food when it becomes a matter of their own individual interest. We lay great stress upon this subject, because absolutely pure, fresh milk—that used *immediately* after milking—does not have to be sterilized or boiled, as it is free from germs of disease or fermentation. Sterilizing and boiling the milk implies that a doubt is cast upon its purity. A babe will not thrive as well upon boiled or overheated sterilized milk as it will upon the fresh article; but unless a person has access to a cow and can milk it for each bottle (which is the thing to do, when possible), no danger of diarrhœa and indigestion should be incurred: the milk must be rendered sterile. Or if this be not convenient, the cow can be milked twice a day, with the following precau-

tions: The bag and teats must be thoroughly washed, and the cow then milked directly into a *well-scoured* jug or large bottle; this should be corked at once and placed on ice, and a sufficient portion poured from it to make up each bottle.

I dwell at some length upon the importance of considering step by step the preparation of a child's bottle, and this is done because it becomes a monotonous work, and unless the mother sees to it personally, the nurse, however devoted, may some time or other become a little careless, and the result may be the souring of the milk, formation of curd, and inflammation of the bowels, and its consequences.

Dr. Parker recommends a pure gum nipple, with two holes as far apart as possible, as the best for the nursing-bottle, and in this connection makes the following remarks: "When there is only one hole, the infant, in nursing, compresses the nipple and sends the milk in a stream in such a manner as often to nearly strangle itself. Milk coming through one hole is not as comfortable as when it comes through two, and the effort of nursing becomes disagreeable and wearisome to the little feeder. The best way to nurse an infant is by holding it in the arms, and give it the bottle in the same position and at the same height as if it were really being nursed by its mother. When it has finished nursing, the bottle should be removed, emptied, and cleansed. Never should the bottle be left in the infant's care to use at will."

We all acknowledge[1] that cow's milk has the following advantages: it serves as the basis for the preparation of a milk resembling that of the mother; it contains all the ingredients that are necessary for nutrition; it is easy to obtain. Its disadvantages are: that the relative proportion existing between its different constituents is not that found in mother's milk; it contains a form of casein which forms hard curds; this casein exists in larger amounts (at least twice as much) than in human milk. It is acid.

[1] Dr. Keating's paper, read before the Convention of State Boards of Health in May, 1886.

A certain time must elapse during which the milk undergoes, possibly, some alteration from exposure to the air, and is liable to be tainted with the germs which produce decomposition; this, indeed, is the greatest objection to its use in our large cities.

It is scarcely necessary to impress upon mothers the importance of always using clean nursing-bottles. Unless the following rules are strictly adhered to, there is no use of reading this book further.

1. *Have a number of nursing-bottles, so that a perfectly clean one is always in use.*

2. *Keep the extra ones, after thorough washing in boiling suds and water, in your sterilizer or in a pan of boiled water, with a teaspoonful of borax and soda in each.*

3. *Use only plain black rubber nipples, have a number on hand, and treat the unused as you treat the bottles.*

4. *Never use nipples with tubes.*

CHAPTER XXIX.

STERILIZING AND STERILIZERS.

By sterilizing milk, water, or, in fact, any material, we mean destroying within it those germs which render it more or less noxious, and making it for a time thereafter an infertile soil for the growth of germs. This may be done (1) by boiling, (2) by more or less prolonged steaming, (3) by keeping the milk at about 155° F. for six minutes, (4) by the use of chemical agents. The latter would be as harmful to the babe as they would be to the germs. Every bottle given to a babe should go through one of these sterilizing processes. Moreover, all the ingredients of the bottle should be sterilized, and the food must be either prepared as needed or made up in bulk, and that drawn from as needed, provided that bulk is most jealously guarded. The whole matter, indeed, would be simplified,

provided we could be certain that milk raised to a temperature of 212° F., was as nourishing as that which is raw, and provided also that those ingredients which we are obliged to add to cow's milk were not altered by so high a temperature. We will deal with these methods in detail.

1. What are the advantages of boiling the milk? As a sterilizer, boiling is certain; there can be no question about it. The germs of typhoid fever die at a temperature of 132.8° F., but it takes a temperature of 212° F., a short time sustained, to completely destroy those of tubercular disease.

Boiled milk will keep sweet, when exposed to the air, at least twenty-four hours. Boiling is most readily accomplished; it needs only such kitchen apparatus as every household, however poor, has already. Boiled milk, in summer, will control diarrhœa; in fact, one of the objections is that it is constipating; but on the whole, taking everything into consideration, in emergencies, or when there is the least doubt about the character of the milk or the dairy it comes from, the advantages of boiling a child's milk in the preparation of its food are greater than the disadvantages. What are the disadvantages? The principal disadvantage, we are told, is that boiled milk is not as nutritious as raw milk; but as the most eminent authorities have taken opposite sides in this matter, we can take whichever side is most convenient and most judicious at the time, and watch carefully those indications which point to gain or not in the child's weight and nutrition, and act accordingly. Dr. Rotch tells us that the investigations concerning the relative digestibility of raw milk and boiled milk are so contrary in their results that he will not dwell upon them in his article. The principal disadvantages, in our opinion, are the tendency to constipation and the fact that the usefulness of lime-water and milk-sugar is in a measure destroyed by the high temperature.

2. What are the advantages of steam sterilizing? The gradual increase of temperature to the boiling-point by means of steam does not have the effect upon the milk of changing

its taste, or of rendering it so constipating. The milk thus prepared is claimed to be as thoroughly sterilized as when boiled in the ordinary way. It is claimed for this process that it has no outward effect upon the milk, leaving it apparently the same as if it had not been sterilized, but that the process is a most thorough one, and when the proper apparatus is used, is the simplest possible way of preparing child's milk. We have strongly advocated this method ever since its suggestion by Dr. Soxhlet and the strong arguments used in its behalf by Dr. Caillé, of New York, and we believe that the number of lives that have been saved by this measure is incalculable; moreover, we felt certain that the purchase of a sterilizer, and the enthusiasm attached to a new thing, would stimulate mothers and others interested in infants to more care in the details of feeding and in the preparation of the milk. Many who would scorn the proposition of using boiled milk would jump for joy at the thought of a sterilizer instead of a farina boiler. This process applied to dispensary practice, as is the case already in some of the large cities, will save hundreds of babes who would otherwise succumb to tainted milk.

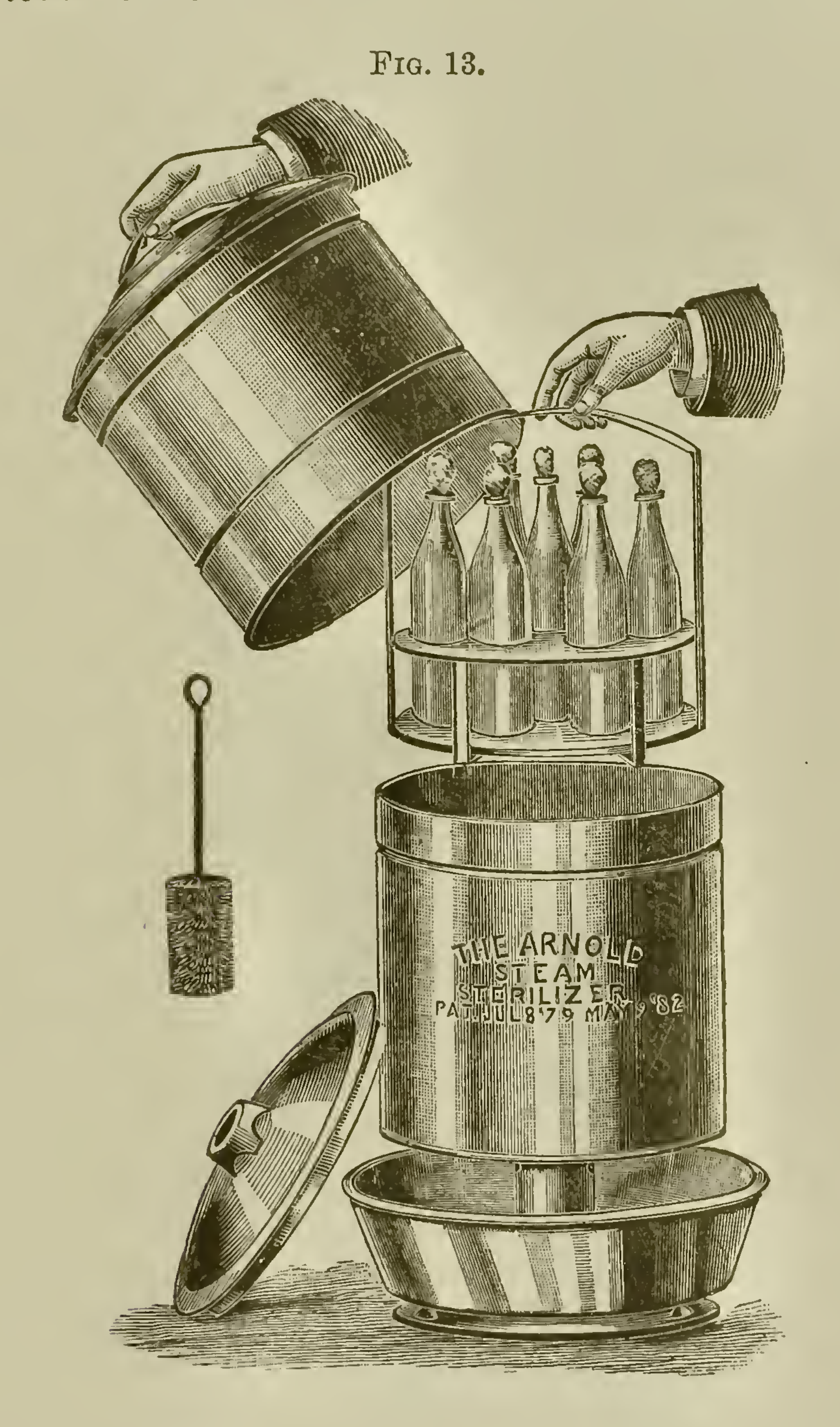
Undoubtedly the best form of steam sterilizer is the Arnold, manufactured by Wilmot, Castle & Co., Rochester, New York (Figs. 13 and 14).

In order to make this matter thoroughly understood we will quote at length from Dr. Walter Mendelson's article in "Babyhood" upon the subject of the Arnold sterilizer.

"*Precautions.*—The milk (or mixture of milk, water, cream, and sugar suitable to age of the child) should be prepared as early in the morning as possible, before the heat of the day has caused the bacteria to multiply. Enough should be made up for the whole twenty-four hours, by multiplying the amount to be used in each bottle by the number of bottles needed. In making the mixture use a pitcher previously cleaned with hot water and soda and by *plenty of rubbing.* Simple rinsing is not enough; so let the pitcher be sufficiently large to easily

admit the whole hand. Scrupulous cleanliness must be insisted on at every step. It is the indispensable element of success, for bacteria flourish in dirt.

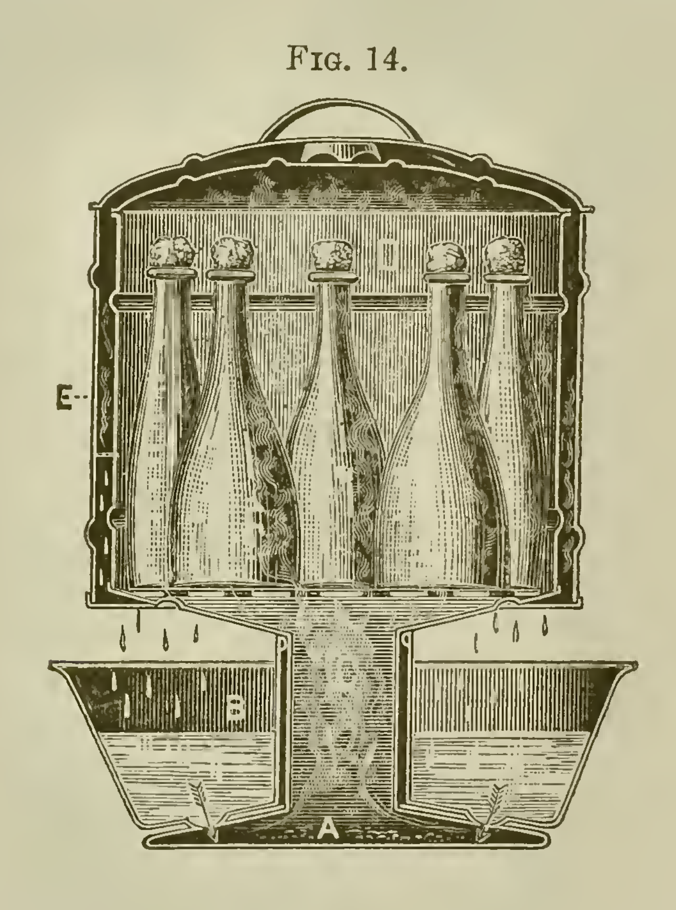
Fig. 13.



" *Bottles.*—The bottles should be the plain, old-fashioned kind, without shoulders, and with a flat bottom, so that they may be stood upright. There is much complaint of the bottles cracking.

To avoid this, heat the sterilizer rather slowly at first, and when the bottles are taken out do not put them upon a cold marble wash-stand, or in the draught of a window-sill, but place them, rather, upon a wooden table to cool gradually. Bottles will last longer if annealed, which may be done by placing them in a large pan of cold water and gradually heating this to the boiling-point, and as gradually allowing it to cool again. They should be of such a size that when filled with the quantity needed, there will be at least two inches of space between the

Fig. 14.



surface of the milk and the lower end of the stopper, so as to prevent the latter being wet with milk.

"Too much attention cannot be bestowed upon the care and cleaning of the bottles and nipples. New bottles should be thoroughly scoured with a hot solution of washing soda and a bottle-brush. If, by chance, milk has soured in a bottle, it should be well boiled in soda, then thoroughly rinsed, and set aside for several hours, filled with hot water to which a teaspoonful of borax has been added. When the child has finished

nursing, the bottle should not be allowed to stand about with the remaining milk in it, but should at once be emptied, rinsed with hot water, and left filled with borax water till the time for final cleaning.

"It is often quite difficult to thoroughly clean a bottle, especially of the greasy rim that forms at the level of the milk. After trying many things, I have found that 'pearline' gives the best results. Use it with hot water and a bottle-brush. Fine specks, consisting probably of some crystalline compound of the milk sugar, are often found adhering with great tenacity to the inside of the bottle. Those that still remain after using the brush may safely be left. After cleaning and thoroughly rinsing in fresh water, the empty bottles should be put on some shelf, out of the way of being splashed or soiled in any way. It is not necessary to keep them filled with water. In filling the bottles, always use a funnel—by preference a glass one—with a stem an inch and a half or two inches long. In this way you prevent the inside of the neck, the top, and the outside of the bottle from being wet with milk, which might, later, prove a path along which germs from without might travel downward into the milk. Should the bottle, after all, have become wet with milk, let a few drops of water run down the inside of the neck and over the top, to wash away that which may have lodged there. Never use the same bottle for more than one feeding. This is a cardinal rule, and I have known all the good effects of sterilizing to be done away with, and a child become very ill, from its having been disobeyed.

"*Stoppers.*—The best stopper consists of a plug made of ordinary cotton batting (not necessarily absorbent cotton), folded into a pretty firm wad, and pushed down for half an inch or more into the neck of the bottle. Make sure that there is no milk about the mouth of the bottle when the plug is put in, and that the stopper is not wet with milk from shaking the bottle before being put into the sterilizer. The advantages of cotton stoppers are: that they are clean,—being always used new; that they are cheap; and that they save labor by re-

quiring no washing, as rubber ones do. When the bottle is in the sterilizer they allow the heated vapors to escape, and when it is cooled again the outside air re-enters filtered of all germs by the cotton it has had to pass through. Rubber stoppers, with a hole for a glass plug, are not readily cleaned. Those with a notch in the side, as in Seibert's apparatus, are better. Only when bottles have to be kept a long time, as for sea-voyages, are rubber stoppers to be preferred to cotton ones. The cotton stopper must not be removed until the bottle is wanted for nursing, and it should then be withdrawn with a twisting motion that will carry all the fibres with it.

"*Nipples.*—The plain conical, pure gum nipple, that has no constrictions in it, and can be easily turned inside out for cleaning, is the best. Nipples should be scrubbed clean like the bottles, and when not in use, kept in a glass of water, to which a teaspoonful of borax has been added."

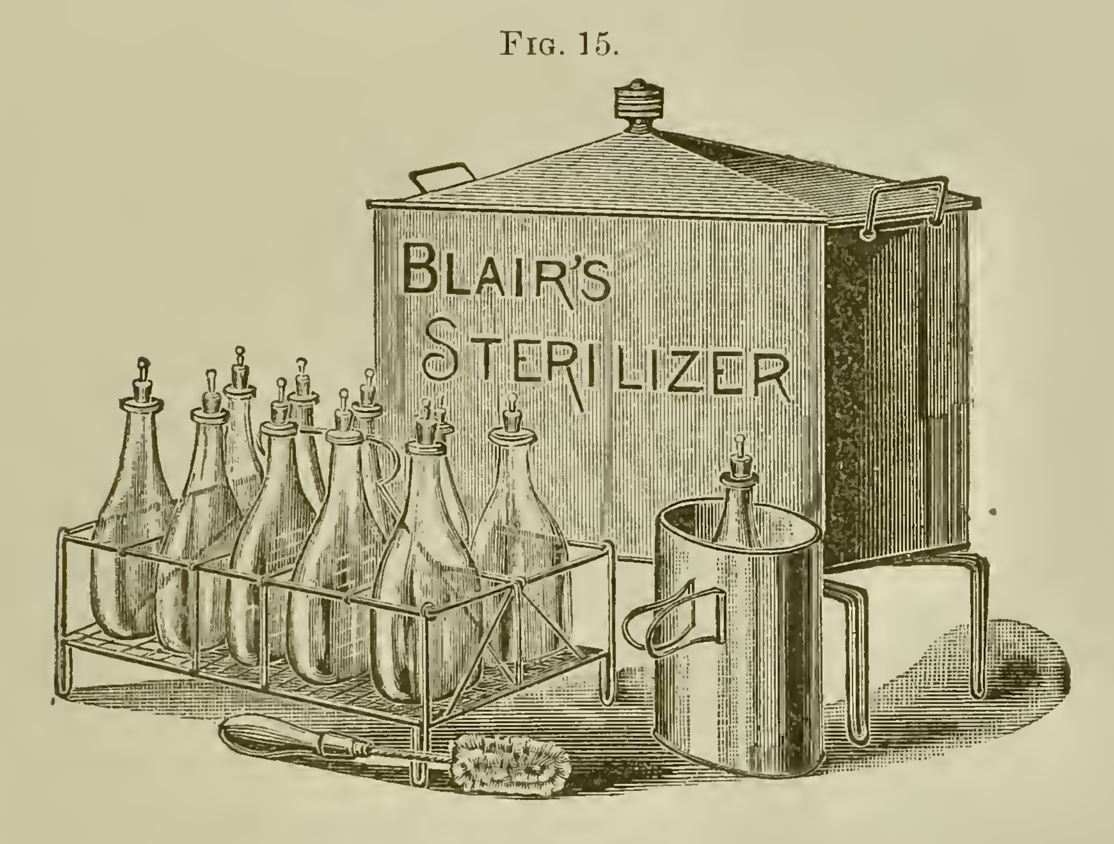
What are the disadvantages of the steam sterilizer? They are precisely the same as attend boiling. Lately, Professor Albert R. Leeds, of the Stevens Institute, Hoboken, in a paper in the *American Journal of the Medical Sciences* for June, 1891, has demonstrated the fact that, for all practical purposes in the feeding of infants, a temperature higher than 155° F. so changes the milk as to render some of its ingredients innutritious; that the sugar is changed to a certain degree, and that the casein and fats are largely altered; that, in fact, milk raised to a temperature of 212° F. is not a nutritious form of food. Dr. E. P. Davis, of Philadelphia, as a joint writer of the same paper, taking his experience from hospitals and dispensary practice, confirms these statements, and claims that the steam sterilizing of milk forms a non-nutritious substance, which, though an admirable substitute for the tainted milk of the alleys in hot summer weather, is not to be recommended as a regular article of diet.

Steam sterilizing also has the disadvantage that the lime-water cannot be put into the milk till it is cool; nevertheless, as this whole matter is still under consideration, and as the weight

of experience seems still to be in favor of the sterilizer, our great test of its value is the condition of the child. If the infant thrives upon its bottles of steam-sterilized milk, that is all that is needed.

3. The marvels of modern surgery grew out of the germicidal action of antiseptics; but when the excitement calmed down, cooler minds discovered that it was *asepsis*—cleanliness—that did the work. Just so I believe that in the majority of cases the milk can be rendered aseptic by care and good sense without prolonged steam sterilization.

FIG. 15.



Professor Leeds has recently demonstrated that a temperature of 155° F., prolonged for six minutes, is amply sufficient, and that the whole mixture can be made without the danger of destroying the lime-water and other ingredients by overheating. You can use for this purpose a sterilizer such as represented in Fig. 15, made by Blair Sons, Philadelphia.

All the small bottles can be filled with the prepared mixture,—that is, milk, cream, lime-water, sugar of milk,—or a large stock bottle may be used, from which a bottle can be filled at

each nursing; for a cork, either a plug of cotton batting or a gum cover can be used; the bottles should be surrounded entirely by water,—a thermometer hanging in the water somewhere, where it can be readily seen; there is no necessity for a cover in this case. You now place the sterilizer on your nursery lamp, the oil stove, or the kitchen range, if necessary; but an oil stove or lamp is much better, as the flame can be regulated so that the temperature of 155° F. can be maintained for about six minutes. Immediately after the heating is over each bottle should be placed in a nursery refrigerator and warmed up as needed, the nipple taking the place of the cotton plug or rubber cover.

What are the advantages of this process? As will be readily seen, the principal advantages of this method are, that we have a sterilized milk about whose nutritive qualities there can be no question, and that the entire ingredients of a child's bottle can be sterilized.

What are the disadvantages? The disadvantages are, that if the milk should happen to be tuberculous,—and some lay great stress on the necessity for precaution in that regard,—the temperaturé is not high enough to kill its bacilli or spores, as it needs a somewhat prolonged temperature of 212° F. for that purpose. Again, it is by no means as simple as boiling or steam sterilizing, and requires more care and intelligence. It is probable also that the milk will not remain sterile for any length of time. It is a method which should only be used when the milk is intended to be given to the child within twenty-four hours.

CHAPTER XXX.

HOW TO PREPARE THE BOTTLE FOR A HEALTHY BABE FROM BIRTH TO TWO OR THREE MONTHS OF AGE.

One would imagine that nothing could be easier than to prepare a formula by which an exact imitation of mother's milk could be attained. We know the ingredients, and the question seems to be one of chemistry alone,—simply the proportions in which to mix them. And yet the matter is by no means settled to the satisfaction of the profession generally. A few years ago it was practically guessed at, and the baby's bottle was never the same. To-day we are working it out on a scientific basis in the laboratory, and are now waiting for our chemists to settle amicably upon one formula, —not that we would always strictly adhere to it; change is a good thing for the digestion; a little less cream to-day and a little more water if the child be fretful or constipated; the omission of the lime-water if the child is very constipated, and the addition of cane-sugar instead of milk-sugar, may now and then be of advantage.

We will endeavor to make the matter as clear as possible, and to give the formula for, and an account of, each method of preparation, so that a mother may so thoroughly understand the subject that she can change from one preparation to another if she finds it necessary, should there be no physician to consult.

We now enter upon one of the most difficult subjects of our book; the reason of this being that it is a subject to which much attention is being paid at the present day, and the brightest talent of the profession is at work by careful study, in the nursery and in the laboratory, to get a perfect substitute for mother's milk. This has not yet been arrived at, though we can now produce a milk mixture which will

agree with the average healthy babe under the ordinary circumstances of life. But when it comes to an unfortunate little one who has not been born with the traditional "silver spoon in its mouth," and who has to withstand the vitiated, devitalized air of a crowded, filthy city in summer-time, there can be but one opinion, and that is, it should have a wet-nurse. we will give a variety of directions in regard to the preparation of the bottle, because the digestion of infants is a complex matter and every babe is a law unto itself, and what agrees with one may not agree with another. Indeed, what agrees with a babe one week may not the next, and the doctor may find it necessary to frequently change the kind of food to suit the child's conditions. We have known splendidly-formed, healthy children result from a prolonged use of condensed milk, though we would never advise its use alone for any length of time; again, we have known babes whose own mother's milk acted upon them like poison, and who never could nurse.

Some most excellent ways of preparing a bottle have been recommended, but the methods are tedious and require great skill and patience and often certain apparatus that mothers cannot get, and therefore a simpler method, which may not be quite as good but almost so, has to be adopted. For instance, the word *sterilize* has a very formidable sound and seems wonderfully scientific, smacks of the laboratory, etc. It really means a destruction of the germs of fermentation and disease, and a temperature of 155° F. will do this, and if the air is excluded the milk will remain pure. But if the milk must be sterile, so must the water that is put into it, the cream, the sugar, the lime-water; the bottle must be clean also, and the nipple, and they must be kept so. Now, it is a difficult and very tedious matter to keep each of these articles sterile separately, and on that account the bottle of milk, when prepared for the babe, is *sterilized* in bulk, as we shall see later.

It must be remembered that *cold* will not sterilize: it checks germ-growth and development; but once warm up the

material and the germs return to life. Freezing will not kill the typhoid-fever germ: it will be preserved in ice, and when that ice melts it will regain its activity. So if you put milk on the ice you only put such germs as are in it to sleep, and when the bottle is warmed or the heat of the child's stomach and intestines warms the milk, the germs of diarrhœa become very active. Cold milk keeps sweet because the germs of fermentation and putrefaction are made torpid; that is why milk is put on the ice when fresh. Milk can be made *sterile* in the morning, and corked air-tight, and the great Pasteur has taught us that a plug of *cotton batting* as a cork is impervious to germs; indeed, it is the exclusion of germs, not air, that we want, and this milk (or prepared food) need not, if so kept, be sterilized again as each bottle for feeding is drawn off. But the cotton batting must have been previously laid for a few moments in the hot oven to sterilize it.

There is very little trouble about rendering a babe's bottle of milk sterile; every house has a stove or range, every kitchen has a wash-boiler, ordinary bottles are easily obtained, and a thermometer is not an expensive article; these, with a few rubber thumb-stalls that will fit over the bottles, or some cotton batting, will complete all the requirements for the most perfect sterilization. Of this we will speak later; suffice it to say that no babe should be allowed to take a bottle of milk that is not sterilized.

The following method of preparation of the bottle has been suggested by Dr. A. V. Meigs, and though it is somewhat more complicated, makes a food much like mother's milk, according to Dr. Meigs's analyses:

Order from a druggist a number of packages of sugar of milk, each containing seventeen and three-fourths drachms; dissolve one of these packages in a pint of water each day. Take three tablespoonfuls of this sugar-water, two tablespoonfuls of ordinary cream, one tablespoonful of milk, two tablespoonfuls of lime-water. Put in nursing-bottle, to be taken warm.

Dr. T. M. Rotch has modified this according to the careful

studies of himself and Dr. Harrington, and gives us the following method. He concludes that there is too much lime-water in the above mixture; that one-quarter of the amount would give sufficient alkaline reaction and make it more closely resemble mother's milk, the proportions necessary being one-half ounce (a tablespoonful) to the half-pint of the mixture, or, in other words, one-sixteenth part of the whole.

He has a measure made of tin or wood that will exactly hold *three* and *three-eighths* drachms of sugar of milk, and he advises the mother to buy the sugar of milk by the pound. It is well to prepare each morning, or morning and evening if fresh milk comes twice a day, sufficient food to last.

Cream (twenty per cent. fat), one ounce and a half;
Milk, one ounce;
Water, five ounces;
Milk-sugar, *one measure.* Mix.

A glass graduate should be used for this purpose. This mixture should be introduced into a clean bottle by means of a funnel, so that the neck of the bottle be kept dry. The bottle is stoppered tightly with a cotton plug. After steaming for twenty minutes, remove the bottle and allow it to cool slightly, and then add *half an ounce* of lime-water. Place on ice.

As *lime-water* figures so largely in the bottle-feeding of babes, we will here quote the method of its preparation from the United States Pharmacopœia (sixth edition).

LIQUOR CALCIS.

It contains about .15 per cent. of hydrate of calcium. "Slake the lime by the gradual additions of *six parts* of water, then add *thirty parts* of water, and stir occasionally during half an hour. Allow the mixture to settle, decant the liquid, and throw it away. Then add to the residue *three hundred parts* of distilled water, stir well, wait a short time for

the coarser particles to subside, and pour the liquid holding the undissolved lime in suspension into a glass-stoppered bottle. Pour off the clear liquid when wanted for use. *When heated to boiling it becomes cloudy, and is then probably valueless.*"

Remarks.—To make this matter clear and more practical we will suggest the following, based upon the above: Take a piece of clean unslaked lime about the size of a hen's egg, put it into a clean preserving jar, and add *six tablespoonfuls* or, if you have a *graduated glass* (this and a funnel you should by all means have), three ounces of water. This will effervesce slightly, and generally heat in so doing. In a few moments add *thirty tablespoonfuls* or *fifteen ounces* of water, and stir with a glass rod occasionally for half an hour. Now let this mixture settle; in the course of an hour or two decant the liquid and add to the lime in the bottom about *one gallon* of water that has been previously boiled and cooled. When this has settled so far as the larger particles of lime are concerned, pour it into a clean, glass-stoppered, gallon bottle, and keep in a moderately cool place while using.

Mothers often want to know the apothecary's measurements:

One drachm equals about sixty grains,—about sixty minims, about one hundred and twenty drops of alcohol (a little less of water),—and is represented by a *teaspoon.*

One-half ounce equals four drachms,—two hundred and forty grains, two hundred and forty minims, four hundred and eighty drops,—and is represented by the *tablespoon.*

Thirty-two tablespoonfuls liquid measure make about a pint, and though a pint is equivalent to a pound, a *level* tablespoonful of a light powder will be equal to only the half of a *level* tablespoonful of a liquid.

This shows the great uncertainty attached to the use of SPOONS in measuring, and we hope the readers of this book will only use *glass graduates* in future.

The milk from an ordinary dairy should be obtained as fresh as possible: mix together half a pint of this milk and half a

pint of pure water, and to this should be added about two hundred grains or two heaping teaspoonfuls of milk-sugar with four grains of bicarbonate of soda, after which two table-spoonfuls of cream should be stirred in, and it is ready for use, to be given by bottle or drinking-cup, at about the body temperature.

We have here a mixture which, according to Leeds, closely resembles mother's milk. This should, of course, be rendered sterile.

We have always, in practice, adhered to the rule that the nearer we could approach to nature's standard the more fortunate we would be in our results in baby-feeding. Thus, the fresher the milk the better; that directly from the cow the best of all; the less we altered it by cooking and extras the more easily assimilated it would be. The feeding of a healthy babe and that of a delicate one are matters totally different, and we are now considering the feeding of the healthy one. Moreover, we have always attempted the simplest measure first, and then gradually felt our way by changing the preparation of the food until we succeeded in finding that which suited the individual case. On this account we have given a variety of suggestions, so that a doctor or a mother may never be at a loss what to "try next," for it is a question of trial, and he who has the most resources at his command makes the greatest success of it.

Our first attempt at bottle-feeding, when we have to abandon mother and wet-nurse, is to use fresh milk and *scald* it; order, for instance, a half-pint of medium (unskimmed) milk, and this is better obtained direct from the cow or dairy; to this add two *teaspoonfuls*, heaping, of milk-sugar and two *tablespoonfuls* of lime-water, and then pour upon it a half-pint of *boiling* water. This is then tightly corked and kept on the ice, and a portion withdrawn for each bottle and the bottle immersed in hot water until the milk reaches about blood-heat (98° to 100° F.). If it be possible to obtain the cow's milk oftener than twice a day, so much the better: it will make fresher food; but it should be

obtained *twice*, morning and evening, at least. A slight pinch of salt is a useful addition to this mixture. Dr. A. Jacobi dwells at length on the great importance of salt in the diet of the nursing mother, or in the bottle of a hand-fed infant. "The quantity of salt in woman's milk is influenced greatly by the direct addition of the same to the food. These facts are of great importance in the preparation of an artificial diet, whether of vegetables or of animal milk, designed for the human infant. The addition of salt is not only of great physiological importance, in the interest of tissue changes in general, but without such addition artificial diet is deprived, from the beginning, of the chemical mixture which renders it quite similar in this respect to the natural. An extremely important fact is also this, that the addition of chloride of sodium [salt] delays and renders difficult the firm curdling of the milk by rennet. Thus, it ought to be added to cow's milk as a general rule, and to woman's milk when the large curds brought up by vomiting, or excavated by rectum, exhibit an undue amount of coagulation." Watch the passages; if they are curdled, and the child has colic, the food does not agree, and must be changed, as, if persisted in, it will set up a catarrh and cause trouble. In this case we would try the following:

For new-born children, or those a month or two old, we may diminish the amount of casein and increase the amount of sugar by the following means: Take one ounce of ordinary milk and three ounces of water; add one ounce of ordinary cream and about a level teaspoonful and a half (eighty grains) of milk-sugar. Indeed, it is better to run the risk of making a mixture with too little casein than with too much, gradually increasing the strength of the milk by diminishing the water.

Or we may dilute the milk as follows:

If to a mixture composed of *one* ounce of ordinary milk and *three* ounces of water we add *one* ounce of ordinary cream (about fourteen and a half per cent. of butter) and about eighty

grains of sugar of milk (a level teaspoonful and a half),[1] we will get a result which closely resembles woman's milk, though containing less casein and more sugar than most authorities give as the result of their investigation. Still, for very young infants this is an advantage. As the babe grows older the amount of casein can be increased as follows:

Take *two* ounces of ordinary fresh milk, add *two* ounces of water. Now add two tablespoonfuls of ordinary cream of good quality and a heaping teaspoonful (about one hundred grains) of milk-sugar. Cream itself contains about three per cent. of casein. But we have insisted that there must be a certain amount of lime added to the mixture, and for this purpose lime-water can be used, a tablespoonful to the bottle replacing one of water. As we have before suggested, if there is the least doubt about the keeping of milk it should be immediately brought to a boil and then placed in the refrigerator, a certain amount being withdrawn and heated over for each bottle. Under no circumstances should a bottle of made food be heated again,—that is to say, what remains over after the child is nursed should be thrown away. It can readily be understood why this is the case when we consider that as the child draws milk from the bottle the air which replaces the milk is that exhaled by the child, and acts most quickly as a putrefacient.

The milk should be given to the child at about the temperature of the body or a little warmer,—that is to say, about as hot as can be borne in the mouth,—a temperature of 100° F. Each bottle should be tasted, to see that there is nothing wrong with it and also to see that it draws well through the nipple. A black rubber nipple is certainly the best to use, and there should be a number of them, so that a clean one which has

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[1] A silver teaspoon, such as is in ordinary use, when filled with sugar of milk and "levelled," will contain about fifty-seven grains; a plated teaspoon contains about five grains less,—practically one drachm. A "heaping" silver teaspoon holds about one hundred and seventeen grains of sugar of milk, —practically two drachms.

been well washed may be used each time. After a child has taken its bottle, if it is drowsy, it should be laid gently on its right side and allowed to sleep. The clothes should be thoroughly loosened, and under no circumstances should it be allowed immediately after taking its food to be tossed or romped with, which, unfortunately, is a very common practice and always ends in indigestion.

To some children *lime-water* seems to be objectionable, and on that account it may be necessary to neutralize the milk with another alkali; and then, again, it would seem more convenient and accurate to have the lime or soda, or whatever is used, and the sugar of milk, in a form that could be kept by mothers and readily introduced into the milk. For this purpose we suggested (*Medical News*, June 5, 1886) the following powder made into tablets, each one containing—

Sugar of milk, 26 grains;
Calcis lactophos., $\frac{1}{6}$ grain;
Calcis carb., $\frac{1}{12}$ grain;
Sodii bicarb., $\frac{1}{2}$ grain;
Potass. bicarb., $\frac{1}{12}$ grain;
Sodii chloridi, $\frac{1}{6}$ grain.

These can be made up in large quantities, put in wide-mouthed bottles, and used as follows:

To prepare the bottle for a child about a month old or younger, take *one ounce* of ordinary fresh milk, *one ounce* of ordinary fresh cream, *three ounces* of boiling water, and add *three* tablets and thoroughly dissolve. If curds appear in the passages, diminish the milk and add water in its place. It is not intended that this whole quantity should be fed to a babe; a child at this age should not take more than two ounces at the most at each feeding.

For a child *two* or *three* months old, prepare the bottle as follows:

Take *two ounces* of good, fresh, ordinary milk, *one ounce* of fresh, ordinary cream, add to this two ounces of *boiling* water, and dissolve into the mixture *four* tablets.

The material can be put up in cans in powder form with a measure holding the quantity that would equal a tablet, and this used in the preparation of the bottle. It needs no additional lime-water.

CHAPTER XXXI.

HOW TO PREPARE THE BOTTLE FOR A DELICATE BABE FROM BIRTH TO THREE MONTHS OF AGE.

In the last chapter we considered the various methods that might be adopted to prepare the food of a healthy new-born babe; but enfeeblement of the digestive apparatus, otherwise dyspepsia, is so common in infants that we are often taxed to our wit's end when we are obliged to bottle-feed them.

So far we have spoken entirely of cow's milk as a substitute for that of the breast; but, as has been heretofore noted, the tendency in cow's milk is to the formation of curds that are compact and indigestible, and, though this can be to a certain extent obviated by diluting the milk as recommended, there are times when, owing to the difficulty in obtaining the pure cow's milk, which is primarily essential, or owing to the delicate digestion of the child, cow's milk seems to be indigestible. We are then obliged to have recourse to some process that will render the milk more digestible, and for this purpose various means have been adopted to make up a child's bottle.

The simplest means of all would probably be to use *whey* only for the first few weeks of life, and, indeed, in many cases this would suffice, as Professor Leeds tells us that the nutritious albuminoids remain in the whey after the curd has been removed by rennet. The milk is warmed and a tablespoonful of liquid rennet is used to the pint of milk. The milk will *turn* if undisturbed, and when the separation has entirely taken place the whey can be strained off. We have frequently found a mixture of two tablespoonfuls of whey, one table-

spoonful of cream, and two tablespoonfuls of boiling water an excellent thing for a new-born babe, especially if curds have been noticed in the passages after a more complete milk diet.

Eustace Smith, for years the pre-eminent authority in England on these subjects, has used the following as bottle-food for babes deprived of breast-milk:

One tablespoonful of fresh cream;
Two tablespoonfuls of whey;
Two tablespoonfuls of hot water.

The whey can easily be prepared in the morning and placed in a clean, well-stoppered bottle on the ice and used during the day. We have frequently advised the mother, if she is obliged to care for her babe at night, to place the child in a crib beside her, and to take to bed with her sufficient *bottles* filled with whatever preparation is used, well corked and wrapped in flannel. If the food has been sterilized at a temperature of 155° F., and the bottles well corked, they will keep perfectly well, and all she has to do is to slip a clean nipple over the bottle in place of the stopper, and the warmth given by the flannel will be sufficient to heat the food. She will thus avoid the danger of catching cold and the annoyance of preparing food so often. As will be seen hereafter, the curd or casein of cow's milk is the great obstacle to its use generally, and especially with delicate babes. On this account we have always found it advisable not to persist in the administration of *milk* if curds are found in the passages, or in case of diarrhœa with greenish and watery evacuations. We would advise that the babe be at once placed on the following until a physician is consulted:

Whey, *two tablespoonfuls;*
Albumen water or acacia water, *two tablespoonfuls;*
Sugar of milk, *level teaspoonful.*

The albumen water—a preparation we have the greatest confidence in as a substitute for milk with sick children—is made by dissolving the white of a fresh egg in a tumbler of water.

The acacia water, which is slightly astringent, is made by dissolving a teaspoonful of powdered gum acacia in a tumbler of boiling water. If the babe is weak, and it becomes necessary to feed often and in small quantities, ten *drops* of wine of pepsin can be added to each bottle.

After the child's digestion has become more tolerant,—indeed, in many cases of infants deprived of the breast without having recourse to anything else,—*peptogenic milk powder* (Fairchild) may be used and the curd predigested. There are cases that seem to resist all forms of bottle-feeding, and whose lives are saved alone by the wet-nurse; again, there are hundreds of babes with good digestion who will thrive on plain cow's milk even undiluted with water. If a babe will digest fresh cow's milk, it is the best food of all.

The following are the directions for using the peptogenic milk powder:

DIRECTIONS FOR "HUMANIZED MILK."

No. 1. *For the Daily Food of a Healthy Nursing Infant.*—Put into a clean agate-ware or porcelain-lined saucepan four small measures,[1] or *one large measure*, of the peptogenic powder, *a half-pint of cold water*, *a half-pint of cold, fresh milk*, and *four tablespoonfuls of cream.* Place the saucepan on a hot range or gas stove and heat, with constant stirring, until the mixture boils. *The heat should be so applied as to make the milk boil in ten minutes.*

Keep in a clean, well-corked bottle in a cold place. When needed, shake the bottle and pour out the desired portion and heat to the proper degree for feeding,—lukewarm.

No. 2. *Specially-prepared Food for Infants with Feeble Digestion or when suffering from Disordered Stomach and Bowels.*—Put into a clean bottle four small measures, or *one large measure*,

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[1] Each can of peptogenic milk powder contains a large and a small measure. Put the powder into the measure with the blade of a knife, shaking it down firmly so as to well and evenly fill the measure.

of the peptogenic powder, *a half-pint of cold water*, *a half-pint of cold, fresh milk*, and *four tablespoonfuls of cream*. Shake well, place the bottle in a pail or tin kettle of water (at least a gallon) as hot as can be borne by the whole hand (115° F.), and keep the bottle there for *exactly thirty minutes*. Then pour all into a saucepan and *quickly* heat to the boiling-point, with constant stirring.

Keep and feed in the same way as directed in No. 1.

If it is absolutely necessary to use condensed milk, one part of pure, unsweetened milk should be first mixed with from two and a half to three parts of water, and it may then be presumed to be equivalent to cow's milk. Then to eight ounces of this mixture add eight ounces of water and the cream and peptogenic milk powder in the usual manner. In other words, we first require to dilute pure, unsweetened condensed milk with about seven parts of water, and to each pint of this diluted milk should be added four tablespoonfuls of cream and one large measure of the peptogenic powder, and treated in the usual manner.

In this connection Dr. Leeds writes to us as follows:

"I know of no process that secures these advantages, except that I have so constantly recommended and now am using without seeing any difference. chemically, physiologically, or practically, from mother's milk: four tablespoonfuls of milk, four tablespoonfuls of water, one tablespoonful of cream, and one measure of peptogenic powder, heated for five minutes as directed. This (temperature is 155°) Pasteurizes; converts the cow's milk to a point at which it gives the reactions characteristic of the albuminoids of cow's milk, gives the same flocculi and has the same susceptibility to digestion, and insures and secures the essential mineral constituents. In short, this process secures the advantages of Pasteurization and of a proper degree of contact with the ferment at one and the same time, and renders cow's milk both innocent and wholesome for infants."

CHAPTER XXXII.

CONDENSED MILK.

This brings us to the subject of condensed milk. A reliable brand, such as Borden's or Canfield's, has the following advantages: When diluted with about ten parts of water, it represents mother's milk pretty closely, with the exception that there is less cream, but to a pint of this mixture four tablespoonfuls can readily be added. It is absolutely necessary that cream should be added to a mixture of condensed milk, and when made the whole mixture sterilized at 155° F. The evaporation of the milk in its preparation has destroyed its tendency to fermentation to a great extent. This most certainly is a great advantage. It will coagulate in flakes, and does not require the addition of any sugar, as by analysis it is shown that when the mixture is thus prepared the amount of sugar it contains is about equal to that in mother's milk. It can be universally obtained, and is useful on that score; its disadvantage in many instances is due to the cane-sugar, and some object to it on the ground that it is supposed in many cases to lead to rickets. Our own experience does not bear this out, though certainly if we were to find that a child fed on condensed milk showed undue acidity, either in its stools or in its breath, due to the presence of lactic acid, we would at once change its diet.

In summer weather the presence of cane-sugar, which is a decided laxative, is objectionable, and herein exists the great difficulty in the proper selection of a food for that season.

Dr. A. Jacobi does not believe that sugar of milk is better than ordinary cane-sugar, and he writes as follows:

"The conversion of milk-sugar into lactic acid takes place very rapidly. When this change occurs in cow's milk, it becomes sour at once. Cane-sugar is not so easily transformed.

Indeed, cane-sugar is utilized for the purpose of counteracting the rapid conversion of milk-sugar, and the preservation of articles of food in general.

"Condensed milk remains intact a long time, on account of the addition of cane-sugar, in spite of the presence of milk-sugar. Therefore, it is not at all an indifferent matter, *whether milk-sugar or cane-sugar is added to the artificial diet.* Still, the use of the milk-sugar has been urged upon other grounds. It has been stated that milk-sugar is to be preferred because it contains phosphatic salts, but verily these may be introduced into the body in other and less dangerous ways. Besides, it will be proven in another part of this book, that phosphates are so plentiful in all kinds of foods that they are eliminated as fast as they are introduced. It has also been said that milk-sugar is contained in milk by virtue of a natural arrangement, and if nature had intended to have cane-sugar in milk, the same nature would have supplied cane-sugar. After all, it is a fact, and often a disagreeable one, that milk-sugar is quickly converted into lactic acid, so that an excess of acid accumulates in the stomach and causes the protein substances to coagulate and become indigestible; it dissolves the alkalies and the calcium out of the phosphate combinations to no purpose except to produce dyspepsia and diarrhœa; it eliminates phosphoric acid before the proper time, and gives rise again to diarrhœa, and, according to Heitzmann and others, to rhachitis. These facts furnish reason enough for carefully *avoiding the use of milk-sugar, and for preferring cane-sugar as an addition to cow's milk* and artificial foods.

"In accordance with what has been said, I assert that artificial nutriments for children ought to be mixed with *cane-sugar, not with milk-sugar*, in view of the active production of acids in the young, their tendency to diarrhœa, and the danger incurred by the premature discharge of salts."

Let us study for a moment the question of the "fresh evaporated milk," which offers for the future the best field for infant-feeding in those cities where it is daily supplied, especially in

summer-time, and where the dairy milk, as served, is of doubtful character. We may add to one part of it seven parts of water previously boiled or filtered.

We find that it will be necessary to add to the half-pint of the above mixture of evaporated milk two tablespoonfuls of cream and two heaping teaspoonfuls of sugar of milk. This will be equal to cows' milk, with about the same percentage of casein as mother's milk. The absence of cane-sugar in this preparation renders it valuable in summer in our large cities, when diarrhœa is prevalent. Indeed, in such cases half an ounce of this milk in a graduated glass with four ounces of water, previously boiled and filtered, given at the temperature of the body, about 99° F., without adding cream or sugar, would in many cases be a most suitable diet. If the bowels are loose, lime-water could be used. Unquestionably, disorders of the intestinal tract are produced by *fermentation* and also by *mechanical irritation* of undigested curds, and this is often due, not alone to the method of preparing the food, but also to the deficient supply of the gastric juices. If a large supply of gastric juice could be encouraged, both of these causes would cease to exist, as the acid mixture is antiputrefactive as well as digestive. We are often obliged to use some means to prepare the milk and destroy its ferments, and to diminish its casein, or so affect it as to allow precipitation in fine masses. The former is readily accomplished by boiling, or by subjecting the milk to heated steam; the latter by several means now in vogue.

The *first*, by rendering the milk alkaline, which retards in a measure the coagulating property of the gastric juice.

The *second*, by diluting the milk with water, which diminishes the percentage of casein.

The *third*, by thoroughly incorporating with it some material, such as gelatin, or a small amount of starchy matter, such as oatmeal-water, barley-water, rice-water, or arrow-root, that will intimately incorporate itself in the casein as it falls, and thus allow the gastric juice to completely attack it.

The *fourth*, by partially predigesting the casein—peptonizing it, as it is called—before it enters the stomach.

We have, in addition to these, various other preparations, which are sometimes added to the milk to render it more nutritious; for example, soluble carbo-hydrates, the so-called "Liebig foods," as dextrin, glucose, or substances rich in albuminous matters. This, in fact, covers the whole ground of the various preparations used in the bottle-feeding of infants, and you will thus see that they all have some scientific basis to work upon, and their choice depends on questions of expediency and reliability, which should be studied in connection with each particular case.

Cow's milk can readily be rendered alkaline by the addition of lime-water, soda, or potash, and the curd affected thereby. We think the importance of alkalinity is somewhat overestimated,—that is, the tendency seems to be to put too much soda in the milk; all that is required is to make it neutral, even for peptonizing purposes.

When lime-water is added to the bottle, one tablespoonful to a half-pint mixture will be in most cases sufficient. It is always well to consult a physician before lime or soda is added to the bottle of milk; there may be reasons why a choice should be made between the two. Indeed, too much alkali may weaken the digestive organs and make the child flatulent and dyspeptic. Vichy or Manitou water is a very good addition to milk instead of lime-water; if the child should continue to pass curds, it should be used in the same strength as lime-water. Dilution with water is a very important matter, because by weakening the milk with the object of diluting the curd we also diminish the fat or cream, the sugar and salts. Now, as all of these are essential to nutrition, it is obvious that by diluting them we are obliged to give the child greater bulk than it would otherwise take, and to overcome this difficulty it is necessary to add cream, sugar, and salts to the bottle in its preparation. The question of the digestion of fat is a very important one. The fats and sugars serve pretty much the same

purpose in the system: they are the so-called carbo-hydrates, and go to the formation of animal heat. But the fats serve even a greater purpose: they are found essential to nutrition; they give strength, and act in that way the same as the curd or nitrogenous principle. Fat is in greatest demand at the time when animal heat is the most required,—that is, during the winter months; the fats and soluble carbo-hydrates, when supplied in excess, are stored for future use; their excess in hot seasons is productive of intestinal disorders. In such cases a change to soups, or albuminous water, made by dissolving the white of egg in water, makes a nutritious diet and is a valuable change. The oils, when stored, give a condition of body which is firm and elastic to the touch, and when this reserve is called upon the emaciation is gradual. On the contrary, when the storage takes place from excess of sugar fat, the fat is not *staying* and its disappearance is sudden. This is well seen in children fattened on condensed milk to which no cream has been added.

Lessen, then, the amount of cream and sugar for the summer season and increase the nitrogenous elements.

The question so often arises as to the exact value of condensed milk and the cases in which it may be used, that we may well be pardoned if we again dwell upon it for a few moments. The heat which is used in making it has destroyed the germs of putrefaction and thereby helped to preserve it. This is a very great gain. Then, also, the statement that only fresh, sweet milk can be condensed is undoubtedly true, as the odor which arises from stale milk would at once expose its character. But in all probability the heat which has driven off the water has acted in the same manner as the heat in the steam sterilization: it has deprived the milk of some of its nutritious qualities, and as a regular article of diet, to be depended upon alone for nutrition, it is not to be recommended. The soft, flocculent masses into which it is coagulated are of immense advantage, especially in young infants; it is the nearest approach to mother's milk. The only question which is at all worthy of

consideration is that of the sugar which it contains and the deficiency of cream, when the mixture is diluted, compared with that of mother's milk. For instance, a bottle made up of an ounce of condensed milk (mothers and nurses should use a large graduated measure in preparing babies' bottles) with ten ounces of water is almost identical in its composition to mother's milk, with the exception that it contains cane-sugar instead of sugar of milk, and has less cream. For a very young infant, one who has been suddenly deprived of breast-milk, a mixture of this kind probably possesses greater advantages than any other milk food, and we feel satisfied that it will agree better and can be more easily prepared than any other bottle. The water should be previously boiled and filtered, the can kept in a cold place, well covered, and each bottle made up fresh. We would even prefer this form of condensed milk to the evaporated fresh milk, which has no sugar, for a very young infant, unless it is previously understood that to the freshly-evaporated milk sugar of milk should be added to each bottle.

In order to be on the safe side, even this mixture should be sterilized at 155° F., as the milk is liable to contamination after the can is opened. Let us, then, be distinctly understood as recommending condensed milk, *not as a regular article of diet*, but simply to be used to bridge over that most delicate period in a child's existence when it is deprived, at an early age, of breast-milk, and when there are doubts as regards the character of the cow's milk from which its food is to be made. It will carry the child safely over a change in the character of its food, which is all-important; it also has the advantages of being always at hand, and when obtained fresh and from reliable sources is usually of about the same quality. We have seen children a year or more old brought up *entirely* on condensed milk, with every appearance of health and strength, and they are unusually fat children, as a rule, but at the same time we would not advise it. There is no necessity for this, as most certainly by the time a child is five or six months old it can

easily digest one of the preparations hereafter recommended, containing cow's milk boiled with oatmeal or barley.

Of course, as a child grows older its digestion becomes stronger: it becomes, in fact, accustomed to its food. A change can be made by adding cream to each bottle in the proportion before recommended,—that is, to a half-pint of the condensed milk, as prepared above, an ounce of ordinary cream may be added. If one lives in the country and milk can be obtained warm, fresh from the cow, it should be used instead of condensed milk; but we would not recommend a city child to be given, shortly after its birth, ordinary cow's milk and water, such as is supplied by the ordinary milkman.

CHAPTER XXXIII.

PREPARED BOTTLE.

The question of the *curd* commands the most serious attention. This curd is always in the way, although it is an important article of diet, being a muscle-forming element; and yet it is not the most important by any means to the young infant, as nature has shown by supplying so little to the human milk compared with that of the cow. We must either get rid of this curd entirely for children who are suffering from disease or indigestion, or we have to so act upon it as to make it either coagulate in flocculi, or to digest it in the bottle, as has been done in the process called peptonizing.

The whey food, or a mixture of cream and hot water, gives us a preparation without the curd at all, or, as in the latter, very little of it, so that children with the weakest digestion can probably live comfortably and thrive on such food; but of course when it comes to growth and development, requiring active muscular exercise, a stronger food is needed, and casein, or curd, becomes a necessity. We will quote here, for the in-

formation of those who are interested in the subject of digestion, a portion of a paper read by one of us.[1]

"Digestion is not merely a process of disintegration; certain secretions are requisite to bring about the chemical changes required. What are these secretions? First, we have that from the salivary glands which changes starch into sugar. The saliva secreted by a child under six months is at a minimum; very little is required, simply enough to lubricate; but I may say that in a series of experiments I have recorded a child of seven days who secreted saliva which possessed sufficient diastase to convert the boiled starch used into grape-sugar. This readily accounts for those infants who fatten on corn-starch, much to the surprise of the family medical attendant.

"As the child grows and teething begins, quite a large amount of saliva is secreted, and undoubtedly the activity of this secretion forms a prominent part in its digestive process; in other words, a child that slobbers, as a rule, has little digestive disturbance.

"The curd is precipitated and turned into peptones, or albuminose. All albuminous matter is so converted, and a burden by no means light is placed upon the liver,—an organ more prominent in infancy than in adult life.

"The precipitation of the casein presents some curious features; indeed, this matter is of fundamental importance in our studies. Woman's milk is alkaline, it is watery, its curd is precipitated in soft flakes. Cow's milk is slightly acid, its curd forms in firm, hard masses of cheesy consistence. The curd in all cud-chewing animals, of which the cow represents the class, is thrown down in masses so as to be readily regurgitated by the calf for the purpose of trituration. In the non-cud-chewers the reverse is the rule. There may be other peculiarities of the curd,—chemical differences,—but these have not as yet been determined."

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[1] Keating, Annals of Hygiene.

Dr. E. P. Davis writes, "These results of investigation, combined with the clinical study of infantile digestion and its disorders, warrant the inference that in the digestion of the infant hydrochloric and lactic acids do not normally exist; that milk is clotted by a rennet ferment active in alkaline or neutral media; that the stomach serves the purpose of a coagulating bottle which is empty in less than an hour after feeding; that digestion and absorption proceed according to the activity of the pancreatic and intestinal secretions, the pancreas being especially concerned in normal digestion, and the lack of its functional activity being most apparent in gastro-intestinal disease."

The secretion from the pancreas is the next and last of importance. It is composed principally of two materials; in fact, a third may be added, the curdling principle; these will act in an alkaline or faintly-acid solution: the first a material analogous to the pepsin of gastric juice, which converts casein, or other albuminous matters, into peptones, and substances that have escaped the action of the gastric juice; and a *diastase* like that of the saliva, which converts starchy matters and cane-sugar into dextrin or grape-sugar.

To the infant the gastric juice is the most important of its secretions; only such food as contains albuminous matter with soluble carbo-hydrates, as glucose and oil in emulsion, should be given; such, indeed, is milk.

We have, then, two matters to consider in the artificial feeding of infants, and we shall limit ourselves to those within the first year: one, the preparation of a food containing the elements of mother's milk, in a combination as much like it as possible; and the other, no less important, the elaboration of those secretions which digest it. An equal balance must be maintained between the two.

The coagulation of the casein of cow's milk into hard masses can be prevented by certain means; one of the most important of them is *diluting with water.* It is for this purpose that water is added to cow's milk; but it has also been noted that

if certain materials which are not digested in the stomach are allowed to become thoroughly mixed with the milk, they will, acting in that way, so honey-comb the curd, as it were, as to prevent its forming a solid lump of cheese. Lime-water may do this,—if the bottle is shaken there will be seen a great deal of lime which is not dissolved in it,—but farinaceous foods, such as the cereals, the starches, if they enter the stomach as such, are not digested there, but probably act in a measure towards the curd as sand does in the stomach of a bird. The cereals, when examined under the microscope, are found to be covered with a material that is destroyed by heat or digested by the gastric juice; the starch in either case becomes free, and the saliva, if it comes in thorough contact with it, will turn it into *dextrin* or grape-sugar; in that state it is carried to the liver. The same takes place when the pancreatic secretion attacks it,—that is, after the food has left the stomach; but as a child has both the saliva and the pancreas secretion in but small amount, to feed it entirely on starchy food is simply to give it starvation diet. It cannot live on such material. Very fortunately for the baby, its corn-starch has to be boiled, and this boiling process converts it into grape-sugar, or at least so nearly so as to allow the contact of the feeblest secretions to finish the work; and fortunately, also, nature often supplies the child with very active salivary glands during its teething period: it slobbers constantly, and the corn-starch food comes in contact with this secretion, which renders it digestible; but the poor infant who is given half-boiled arrow-root, or flour, or corn-starch too thick to flow readily through the bottle, and who cuts its teeth hard,—that is to say, has dry gums, little secretion,—will not be long before it shows an inflammation of the bowels that will be the cause of its death.

The reader can now see why it is that some children get along well on corn-starch food and thrive from a very early age upon *boiled* bread and milk, cracker-dust food, or substances of that sort; but, unfortunately, it is these very chil-

dren who form exceptions to the rule that cause the invariable evil result by tempting mothers to give starchy food to two-thirds of the children when too young. A cereal may be added to the child's bottle after it is three or four months old, if it be deemed advisable, beginning with a very small quantity.

The simplest and one of the best ways of preparing the bottle is the mixture suggested by Dr. J. F. Meigs and used by him for so many years with success. A two-inch-square gelatin cake is soaked for a short time in half a pint of cold water, the water is then boiled for fifteen minutes until the gelatin is thoroughly dissolved, a teaspoonful of arrow-root, rubbed into a paste, is stirred into the boiling water, and then the milk added in the proportion of one-third milk and two-thirds water for the new-born, two-thirds milk and one-third water at six months, varying in proportion at the ages between. These are allowed to boil together for a few minutes, and then for the young infant two tablespoonfuls of cream are added to the pint of food, and to this about six and a half drachms (or teaspoonfuls) of sugar of milk, or three teaspoonfuls of white sugar.

Dr. J. Lewis Smith recommends for the preparation of infants' food the following plan: Take from five to ten pounds of well-selected wheat flour, put this into a bag, tie firmly, and keep covered with water for several days, possibly a week; this should occasionally be made to boil. In the preparation of the bottle for a child under three months, the water used for diluting the milk should have boiled with it some of this flour, grated in the proportion of two heaping teapoonfuls to a pint; after the sixth month four teaspoonfuls.

Another excellent preparation is made as follows: The milk is diluted with its bulk of water, which should be previously thoroughly boiled with either ground barley, oatmeal, or baked flour, in the proportion of a *dessertspoonful to the pint*, the milk poured in while the water is boiling, the whole boiled together for from twenty minutes to a half-hour at least, and then strained. This may be sweetened, an ounce of cream

added, and the whole forms an excellent food for a child after its fourth month.

It being understood that a cereal such as barley, oatmeal, or Graham flour is not to be given to a child as the *basis* of its food, but only to slightly thicken the milk and give it substance, and to prevent heavy curding, the choice of the article is a matter for consideration in each individual case. Mothers ought to know that the outer portion of a grain of wheat, corn, or oats—in other words, the bran—acts as a laxative, and it is on that account the crushed grain is more valuable where there is a tendency to constipation. Next to the outer surface we have that portion of the grain in which resides most of the nitrogenous principle, the so-called *gluten:* so that in the debranned flour we have a preparation which is nourishing and fattening, but not laxative. The internal portion of the kernel of all these cereals contains the starch-granule, and this part we know gives the tendency towards constipation, and is least nutritious of all, but is the heat-forming element; thus, in the *whole* crushed grain we have all the elements necessary for health and nutrition. When it is desirable to use any of these cereals it is far better to use the whole grain, crushed, unless there should be looseness of the bowels or irritation of some sort, in which case the flour alone should be used. But mothers should bear in mind what we have laid stress on before, that whenever a starchy food is used the *starch-granule should be thoroughly broken up by heat, either by baking or by boiling.* This is an essential matter, and we cannot repeat it too often.

When a mother wishes to put her child on the bottle (supposing it to be about the age of four months), and wishes to add something to the bottle, it is a difficult matter to know with what to begin. Dr. J. F. Meigs advises gelatin and arrow-root; Dr. J. Lewis Smith, of New York, advocates the flour-ball,—that is to say, flour tied in a linen rag and boiled for hours, then taken out, grated, and used with the milk. Our own preference is for barley: it is the least constipating

and usually agrees well, and after the child has become accustomed to it and the digestion is in good condition, a small amount of oatmeal may be added with each or every alternate bottle, and a variety of diet in that way instituted.

Now, in preparing the barley for the bottle we may either take the whole-grain pearl barley, and have it crushed in a coffee-mill, or use Robinson's barley, which comes in packages, finely powdered. Of course the latter is easier manipulated and requires less time to prepare. Of the powdered barley, take a dessertspoonful, mix it into a smooth paste with a little water, and gradually stir this into a pint of boiling milk. If the child is under six months of age you can then add from one-half to one-third of water, and, stirring constantly, allow the mixture to boil *fully* twenty minutes. To this can be added a heaping teaspoonful of white granulated sugar and a pinch of salt. It should then be strained. Now, if this mixture is put in the refrigerator at once when it is made, in the morning, it can be used for each bottle by warming over and straining. If there is much constipation, oatmeal or Graham flour (cracked wheat) can be used in the same way. A variety of oatmeal known as the Bethlehem oatmeal comes powdered for this purpose. It is simply a carefully-selected meal well ground; any good oatmeal will do as well. Of course, if the coarser grain is used, the boiling process will have to be very much prolonged; and in such cases, if simply the crushed barley, the cracked wheat, or the ordinary oatmeal is made use of, it will be necessary to boil it in water beforehand, say a heaping dessertspoonful to a quart, and the whole allowed to simmer until it is boiled down one-half. Then this can be added to the milk, stirring well, and either both boiled together for a few minutes, or, if the child is constipated, simply scald the milk by pouring the boiling water and meal into it, stirring it meanwhile, and then strain. The sugar and salt can be added.

In city practice we always recommend the boiling of the

milk for precaution's sake, and think the tendency to constipation can be overcome by giving the child occasionally a bottle of water, which it will readily take. It is important to bear in mind that the food should never be made so thick that it will not run through the nipple. The food should be made in a farina-boiler, that the milk may not become scorched.

As we have said, the selection of food is to a certain extent an experiment, and therefore the child should be watched to see whether it exhibits any symptoms of indigestion. Regurgitation of food, the souring of it in the stomach, flatulence, hiccough, nausea, and, finally, either constipation with great pain, passage of curd, undigested milk which has a disagreeable odor, white passages, or diarrhœa, are of course all evidences of indigestion, but these must not be confounded with the symptoms that are brought about by tight bandaging, jolting, dancing the child up and down after a meal, forcing it to take more food than it can conveniently carry or digest.

We have often seen cases in which the mother blamed the indigestion on the diet when the food had agreed perfectly well, but the indigestion had been brought about by the way in which the child had been treated. If the child uses the bottle, it should not lie flat on its back, but should assume the same position that it occupies when nursing from its mother. It is well always to avoid the use of purgatives or laxatives, in bottle-fed children, as far as possible. Use in their stead the more laxative cereals.

Remember that water is nature's most efficient laxative, that when salt is added to the food it has the same excellent effect, and that regularity and the establishment of habit, both in its feeding and in the timely movement of its bowels, is of the greatest value to the child. Do not think the amount of material you put into a child's stomach is alone necessary for its sustenance. Do not think that because a child is given a quart or more of milk a day it is all that is necessary, and that it must thrive whether or not. This is a mistake which

mothers are constantly making. *It is the amount that is digested and absorbed that nourishes, the rest decomposes or irritates.*

This brings us to the subject of predigesting the curd.

Professor Albert R. Leeds, of Hoboken, gives us the following way of preparing milk for infants:

> One gill of cow's milk, fresh, unskimmed;
> One gill of water;
> Two tablespoonfuls of rich cream.

To these can be added one powder which contains *two hundred grains of sugar of milk* and *four grains of bicarbonate of soda* with *a grain and a half of extract of pancreas.* These powders, each one containing the above formula, can be made up in any drug store. The milk, with this powder added to it, should be put into a nursing-bottle, which should be placed in hot water—so hot that the hand cannot be held in it for more than a minute at a time (115° F.)—and kept there for about twenty minutes, and then allowed to cool sufficiently for the child to take. This powder is called *peptogenic milk powder.*

In a lecture before the Philadelphia Hospital Nurses' Training School, Mr. Fairchild spoke as follows:[1]

"When we speak of peptonizing food, we do not mean that pepsin is employed in the digestion of the food. We simply mean that the albuminous portion, the casein of milk, for instance, is converted into peptone. The materials used for the purpose are the ferments of the pancreatic juice in the form of a powder,—the extract of pancreas.[2] This contains several ferments, each of which acts on a different form of food. The conditions under which these ferments act are very simple. If, in attempting to digest milk, you add the ferment to the milk when it is very cold, no action will be obtained. Again, if it is added to very hot milk, no action will be obtained. The conditions under which these ferments act are similar to those found in the body. A good test for determining the

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[1] Reported by Dr. William H. Morrison, Holmesburg, Pennsylvania.

[2] Or the "*essence of pancreas,*" or the "*liquor pancreaticus.*"

temperature of the food is to taste it. If it is hotter than can be sipped with ease, it is too hot. If it is desired, a little thermometer may be employed to obtain the proper temperature, whieh is 100° F.

"I shall now show you how to make peptonized milk. I take one of these 'peptonizing tubes,' which contains five grains of pancreatic extraet and fifteen grains of bicarbonate of soda, and empty its contents into a quart bottle. To this I add a gill—that is, four ounees or eight tablespoonfuls—of cold water, and if it is for infant feeding, the water had better be previously boiled. Enough may be boiled in the morning to last all day. I next pour into the bottle a pint of milk, and shake the bottle well. By adding the water and milk cold, we run no risks. Having done this, the bottle is set into a bowl of warm water, whieh should be of such a heat that you can hold your hand in it for a minute; the temperature of the milk is thus raised to about 100°. The milk is allowed to remain in the water for half an hour; it is then put upon the iee, and the digestion will still eontinue for some time,—until the milk is thoroughly chilled, after which no further digestive ehange ean take place.

"I have here a bottle of milk which has been digested in this way. I have allowed the digestion to be carried a little further than is usually necessary, in order that I might show you the properties of peptonized milk. I first take ordinary milk and add an acid to it. At onee a mass of coagulated casein falls to the bottom of the glass. I treat a sample of peptonized milk in the same way, and there is no traee of easein. As I have said, it is not usually necessary to digest all the easein, and the direetions which I have given are for average eases. You have to observe the effeet of the milk on the patient's digestion. If it is assimilated readily, the proper predigestion has been seeured; but if it is necessary to digest it still further, the milk may be allowed to remain longer in the hot water. If the milk has been digested too much, and is a little bitter, it may be made agreeable by the addition of a little

sugar. You will soon learn by experience how to adapt the process to the requirements of each case.

"Instead of using plain water, we may take a quantity of starch paste, add a little pancreatic extract to it, and stir it up. When starch is boiled it simply swells up, but within a few minutes after the addition of the pancreatic extract it becomes a thin liquid from the digestion of the starch,—by the pancreatic diastase; this starch is now in the way of being converted into glucose or grape-sugar. This may be put into a bottle with the soda and milk, and digested in the manner just shown, and we shall have peptonized milk gruel. Here the nutritious elements of the starch are added to the milk. In using the peptonizing powder *a little water* is always used to dissolve it, otherwise it would be slightly curdled by the extract of pancreas.

"This peptonized milk can readily be made into lemonade. It may strike you as rather odd to add lemon-juice to milk, but as the milk has been completely peptonized, it will not curdle, and the lemon is often desirable to make the milk pleasant. Rum and sugar may be added if stimulants are required, making a delicious punch. It may also be taken with carbonic-acid water, and, if thought necessary, lime-water may be added, although we have already added an alkali.

"You may make a peptonized milk jelly. If you wish to make a jelly, it is necessary to allow the digestion to progress for a longer time. A pint of peptonized milk is heated to the boiling-point,—that is, you scald the milk. This is necessary to destroy the ferment. Then take three-fourths of an ounce of Coxe's gelatin, a tablespoonful of lemon-juice, and a couple of tablespoonfuls of orange-juice. When the milk is scalded some of the lemon- and orange-peel may be scalded with it, which gives a fresh flavor of the peel. The gelatin is then added, and wine, brandy, or St. Croix rum may also be added. If you do not remember to scald the milk, you will not get a jelly, for the extract of pancreas will not only digest the casein, but it will also digest the gelatin.

"In digesting meat, take two tablespoonfuls of chicken or beef finely minced and boil it with a gill of water. This makes the meat soft and facilitates its digestion. The meat is then rubbed into a fine pulp and put back into the water. You may now add a gill of the starch mucilage and one of the peptonizing powders. It is then set aside for two or three hours, and at the end of that time scalded. The peptonized soup may be seasoned to suit taste. The scalding is necessary to stop the digestion, which otherwise would go on and lead to but refractive changes.

"This plan may be used with ordinary soup. Take two or three tablespoonfuls of the meat, barley, etc., strained from soup, rub it to a pulp, and add fifteen or twenty grains of pancreatic extract and half a drachm of bicarbonate of soda; add to a pint of the soup, and proceed as just shown. There is no doubt that you get artificial digestion of all the substances, and at the same time you have no more trouble than in making ordinary food. If this is strained, and gelatin added, you obtain a nice clear jelly. The peptonized milk jelly is more agreeable than those made with ordinary milk.

"In preparing peptonized milk for babies, we follow a little different plan. In using cow's milk we have to dilute it with an equal quantity of water in order to obtain the proper amount of casein. We have to add a small quantity of milk-sugar to make up for that lost by the dilution with water, because mother's milk contains a little more sugar than cow's milk. Then we have to add the alkaline salts which are found in human milk. Dr. Keating spoke of the acidity of cow's milk, and this is a point which few people properly appreciate. Testing this sample of milk with litmus-paper, it is found to be distinctly acid, and, in fact, I have never tested cow's milk without finding this acid reaction. Here we have a powder (peptogenic milk powder) which presents the proper proportion of *milk-salts*, *milk-sugar*, and the *digestive ferment* to change the casein into the soluble form in which the albuminoids exist in mother's milk. I take *four ounces of milk*, add the proper

amount of the peptogenic milk powder; next we add *four ounces of water* and *two tablespoonfuls of cream.* This latter is an important element, for mother's milk contains more fat than cow's milk. In this way we obtain the same *proportions* of the different elements as are found in human milk. All that is now required is to heat it to the proper temperature for five or six minutes in order to properly modify the casein. The temperature is to be determined as in the former case by sipping or by the use of the thermometer. In this process, having first made a milk mixture which contains the right quantity of all the elements of mother's milk, and with its peculiar alkaline character, then we seek to effect just such a change of the casein—the 'curd'—as will present it to the infant's stomach in the condition fit for digestion, in such a condition that it will behave in the stomach just as mother's milk does, and make the same demand upon the natural digestive functions. If, however, the baby is very ill, and not even capable of digesting its natural food, this method allows you to digest it still further.

"There are two other ways in which the 'humanized' milk may be prepared. Instead of taking the quantity of milk which I have done, we may take a larger quantity and a proportionately larger quantity of the other ingredients, mix them and keep them on ice. There will be no action as long as the low temperature is continued. The proper amount may be poured out and heated whenever it is required.

"The other way is to make the mixture as just described, and stand it in warm water for fifteen minutes. This will give the proper amount of digestion. Then scald it; this kills the ferment, and the milk can be kept with no more care than ordinary milk. You can then take the proper amount and warm when it is needed, and you have no further trouble with it. For asylums, where there are many children, this is probably the best way. This gives us milk which is as exact an imitation of the natural milk of the mother as we can expect to obtain it in practice."

The extract of pancreas can be obtained at any drug store,

and peptonized milk is at present highly recommended by all physicians in this country and Europe, when prepared according to the directions just given, for infants who are suddenly deprived of mother's milk or for those that are sick. A certain amount of care is required in the preparation of this food, because if the peptonizing process goes on too long the milk will become bitter and the child will refuse it; if it does not go on long enough, the curd, of course, will not be affected. There is another quality which the extract of pancreas possesses that is as important as that of the digestion of casein, which is, that a small quantity of it, when added to the broken starch-granule, will aid in converting it into grape-sugar and thereby render it digestible; for instance, if a child's bottle be made up of barley-water and milk or oatmeal, a few drops of the extract of pancreas in solution will render certain its digestibility. And for children who have a tendency to diarrhœa, or with whom starchy food fails to agree, this can be made use of.

This brings us to another subject. Anything which will convert the cereals into grape-sugar before the food is taken to the child, will aid in nutrition. Why? Because these cereals not only contain starch, which goes to supply fat and heat, but they also contain albuminoids, as gluten and other nitrogenous materials, which go to the formation of muscular tissue, and salts, which are bone-forming. If the whole grain can be so prepared as to be perfectly digested, a great deal will have been gained in the nutrition of the child, and for this object various foods have been suggested. A substance which converts starch into sugar is diastase, or malt. Each granule of the cereals possesses a certain ferment which, if allowed to develop by heat and moisture, will turn the starch into sugar. This is made use of in the preparation of food for children, such as Liebig's foods, where the starch has been turned into grape-sugar by malting. As will be readily appreciated, there is no necessity for the addition to the milk for very young babes, or for those that are very delicate. Mellin's food is prepared on

the same principle. It is a fat-making and nourishing food, which when taken into the stomach will increase the nutrition of the body and store up a certain amount of fat, and is valuable because it requires very little digestion. The child at birth, however, requires simply milk of the character which nature presents. It needs no more albumen and no more sugar. What we want is to supply a milk as nearly as possible of the quality furnished by nature. All that we need is a milk which will be digested and readily absorbed. But we insist upon the importance of feeding a babe from birth to at least three months on some preparation of milk alone.

Any preparation of malt that will aid the digestion of starchy food is useful, not only for adults who suffer from flatulence and debility of the digestive organs, but it is also good for infants, when given in moderation; but we advise mothers to avoid these preparations for their *very young* babies. This leads us to the consideration of those foods, in addition to the child's bottle, which either aid in the digestibility or are themselves of value in supplying nourishment. According to Professor Leeds, these classes of foods may be divided into the *milk foods*, the *farinaceous foods*, and the *Liebig foods*. We give many of the different preparations under these headings, in order that the mother can intelligently make her choice, should one not agree with her child.

We have said before, and may repeat it here, as it is a very important matter, that the choice of a food for a child is a matter of experiment, for what agrees with one may not agree with another, even in the same family; that the test of whether or not a food agrees with a child is if the child thrives upon it,—if it sleeps well, if its flesh becomes firm, if its digestion is good, if its temper is amiable, and if it gains in weight,—because a cross child, in nine cases out of ten, is either a dyspeptic or a sickly one. These tests are the only ones that are of value, notwithstanding the advertisement that such and such foods are the only ones that agree with the baby. As the child grows older, a farinaceous food may be given in the way described

before. Should the passages become constipated and there be much flatulence, should the child suffer from colic, become restless at night, lose its appetite, then the change should be made to one of the Liebig foods, and in this way its digestion encouraged and nutrition established. An intelligent mother watching carefully her child can thus be guided in the choice of its food; but it should be always borne in mind that as milk contains all of the elements for nutrition in such proportion as is required, those foods which are not *milk foods* should always be made up with milk in the preparation of the bottle; and if fresh cow's milk cannot be obtained for this purpose, a *milk food* well diluted should be used, such as ordinary condensed milk, *fresh evaporated milk*, or one of the *milk foods* given in the table:

MILK FOODS.

Carnrick's Soluble Food,
Anglo-Swiss,
Gerber's,
American Swiss, and others.

FARINACEOUS FOODS.

Blair's Wheat,
Hubbell's Wheat,
Imperial Granum,
Hard's Food,
Ridge's Food,
Robinson's Patent Barley,
Bethlehem Oatmeal, and others.

LIEBIG FOODS.

Mellin's,
Malted Milk,
Lactated Food,
Hawley's,
Keasby & Mattison's,
Savory & Moore, and others.

Frequently a child may be so weak or exhausted from disease or from inanition that food of the mildest character will not remain on its stomach. It would be useless to keep on diluting condensed milk, as it would render it valueless. In cases of this sort, the white of an egg shaken up in a bottle of warm water to which a couple of grains of lactopeptine or Fairchild's liquor pancreaticus is added, sweetened and given by the bottle if the child will nurse, and by spoon in small amounts if the child will not, is very nourishing. Wine-whey can be given in the same manner. Gum-arabic water will nourish for a surprisingly long time, and allay irritability of the stomach and bowels, and finally, the child can be gradually encouraged to take small and repeated quantities of peptonized milk. No babe, of whatever age, should be fed exclusively for any length of time on bottle-food that has not *fresh milk* as one of its ingredients. We insist upon this, as cases of scurvy have undoubtedly come from the prolonged use of stale preparations.

It should be remembered that all infants need water. For the nursing babe a tablespoonful of boiled water should occasionally be given; for the bottle-fed babe an occasional bottle of vater is a necessity and must not be forgotten.

CHAPTER XXXIV.

WEANING.

THE question is often asked, At what age should weaning begin, provided that there is no immediate necessity, and how should the process be managed? It greatly depends on the family arrangements for spending that season of the year which in this part of the world is most to be dreaded, the summer. Of course, if a child is to be taken to the sea-shore, or some cool summer resort, where milk can be supplied fresh and in abundance, the question of weaning in the summer-time

has not half the importance attached to it that it has to those who are obliged to spend the summer in, or near, one of our large cities. Our own opinion is that if a child has been nursed for four months, certainly for six months, the gradual addition of a bottle to its dietary will be of advantage. A child partly nursed and partly bottle-fed, after its fourth month, thrives better than one bottle-fed alone; in fact, breast-milk helps to make the bottle-food more digestible. Not only is this the case, but it is a great relief to the mother, gives her more time to rest, occasions less drain upon her nutrition, and is also of importance should the child be obliged to take the bottle, either because the mother's milk gives out, she becomes pregnant, or her health gives way; but four months is young enough, provided the mother's milk is found to be of good quality, nourishing, and the child thrive upon it. An occasional bottle, in addition to nursing, will have a tendency to concentrate the breast-milk, making it more nourishing, and thus avoid the necessity of weaning altogether for a few months more.

The addition of a bottle or two during the night will give the mother a good night's rest,—a most important matter. Apart from the great importance to the child, the nursing by its mother will have usually a most desirable effect upon her own health, unless she be consumptive. It is a law of nature and therefore is beneficial. It will aid much in reducing the womb to its normal size; indeed, a mother who does not nurse her babe is apt to have some womb trouble following her labor.

For a child that is born as late as January or February we would not recommend the addition of any bottle-food until the following October, provided the mother is able to nurse it. For a child born in October or November, and especially when the following summer can be spent out of town or at the seashore, the weaning process could possibly be all over by May. If a mother is strong and hearty, has no consumption in the family, has plenty of milk, is not in the least pulled down by nourishing her baby, and can nurse it a year, it is so much

the better. For the last six months her child can take some bottle-food in addition. A mother should not nurse her child for more than a year; there is no necessity for it. The milk is not sufficiently nourishing, and unless it is supplemented by the bottle the chances are that the child will become sickly. Indeed, a good, strong, healthy child that becomes accustomed to the bottle-food will wean itself before that time is up, and this is exactly what we wish a child to do,—*to wean itself.* Now, in the gradual process of weaning or the addition of a bottle to its regular nursing, the babe of five or six months may take its food according to the following programme: It should nurse from its mother in the morning at six or seven, and then after its bath take a bottle about half-past ten or eleven o'clock; possibly nurse from its mother about one or two o'clock; again a bottle at five or six; and then the mother should nurse it on retiring at ten or eleven. In this way it becomes gradually accustomed to the bottle at the time of day when it is most apt to agree. This also gives the mother an opportunity to take exercise and rest. Possibly it may need a bottle about four o'clock in the morning.

The question is asked, What should be the first choice when selecting the bottle-food of a child at this age,—four months?

Certainly the first choice should be the simplest preparation and one which will tax the digestive organs least. The chapter on bottle-feeding should be consulted in regard to this matter, and that preparation of milk, cream, milk-sugar, and lime-water recommended by Dr. Rotch or the proportions advised by Professor Leeds should be tried first, remembering that the mixture must be sterilized, and that the sterilization at 155° F. is the one we particularly advise. The next bottle-food that can be tried is the formula of Dr. J. F. Meigs, of milk, cream, gelatin, arrow-root, and lime-water, and finally, barley, oatmeal, rice, or flour can be added as is advised in the chapter under consideration. As the child grows older, the mid-day bottle can be varied. We believe that by using a mixture of the cereals we often get a more palatable and more nutritious preparation than by using

them singly; thus, oatmeal and barley, or Graham flour, can be used together, or oatmeal and rice. The child will show a decided preference for some kind of bottle-food, but bear in mind that it is a great mistake to stuff a child. The mother will often be tempted to add a little more oatmeal, or Mellin's food, etc., thinking that a little increase will make her baby stronger and rosier. This may be true if the child lives in the country or at the sea-shore, where it is out of doors all day long, in a cool, bracing climate, especially if it is able to run about; but if mothers could see, as doctors do, the numbers of sluggish, heavy children that our cities afford, with coated tongues and foul breaths, and constipation, who are fairly packed with "baby foods" and all the most concentrated articles of diet that modern chemistry presents us with, they would understand why it is that the ill-fed, ill-clothed children of the poor, who live on a crust and digest it, are so much more able to resist disease than their own. It is on this account we believe that, although oatmeal is a most valuable addition to the diet, it should only be used in small amounts, should be thoroughly boiled, the children when taking it kept out of doors as much as possible, and should not be used in hot weather, nor with children who have what is called a "bilious tendency."

If fresh cow's milk is not obtainable, condensed milk can be used in this gradual weaning of children: one part to ten parts of water, and fresh cream as before recommended. Some studies we made a few years ago convinced us that woman's milk contains a diastase or ferment capable to a slight degree of turning starch into grape-sugar, and that cow's milk does not possess this. Possibly this accounts for the excellent results that are frequently found in the association of breast- and bottle-feeding. Let us here say again that when we use any substance besides milk in its bottle, such as the cereals, we should not forget that the child needs water,—pure, clean water to drink. Very often a child that is partly bottle-fed and partly nursed is restless at night,—will not sleep. Instead of the mother's trying to put it to sleep by nursing it, if she

would simply give it some water in its bottle, or possibly a little Mellin's food in the water, it would go to sleep and not run the risk of indigestion from over-feeding.

Dr. A. Jacobi,[1] writing of the necessity at times for supplemental feeding, says,—

"Such practitioners and authors who convinced themselves of the ill success often attending the use of milk, or watered milk, commenced at an early period to mix it with meat-soups, meat-tea, or egg. The administration of some beef-soup, well made, a cupful every day (mutton-broth when there is a tendency to diarrhœa), is advisable towards the end of the first year. Long before this period, indeed, at any time during infancy, is it indicated in cases of early rhachitis, rhachitical constipation, undue adiposity, and retarded teething.

"Beef-tea, well made, in the bottle swimming in the water-bath, is still believed by some to be the model food. That it is not so rich in soluble albuminoids as was believed, ought to be generally understood by this time. What, however, it does contain in large quantities is salts. Thus, it is a dangerous article in summer diarrhœa, and must never be administered by itself. When given at all, it ought to be in combination with farinacea, raw albumin (which, in this mixture, requires very little salt, if any).

"Egg has been utilized as an admixture to milk, or as its substitute in a great many ways. The yolk and the albumin have been so employed. The white of an egg, with a little salt and six ounces of water, well beaten and shaken, is a good mixture, which can take the place of infant food but temporarily, but is an invaluable makeshift in severe intestinal catarrh, or a permanent nutriment in the same when added to other food.

"In the course of the second half-year some changes may be made in infants' diet. In the relation of the barley preparation to the milk a change should be made; the milk may exceed

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[1] Intestinal Diseases of Infancy and Childhood, p. 89.

its former quantity, and in the same proportion in which the children are permitted and accustomed to drink pure water, the food may become more condensed. Towards the end of the first year the quantity of barley or oatmeal to be used in the decoction may be increased. It is soon enough to begin the use of pure milk in the third half-year, if at all. About the eighth or the tenth month the chewing of a crust of bread or of a piece of "zwieback" may be allowed. About this time, too, the daily allowance of meat-soup may be increased to two hundred and fifty grammes, and in addition one or two tea-spoonfuls of broiled beef may be given. These articles, distributed through four or perhaps five meals, will be sufficient for the greater part of the second year. The quantity may be gradually increased, but a more radical change is useless. If a child, which is healthy and is not spoiled, awakens at night, it needs and desires nothing but a drink of water, or of thin barley-water without milk.

"About the middle of the second year, when the child begins to use a spoon, the breakfast may be made up of more solid elements than heretofore, barley broth or oatmeal mush, thoroughly cooked, an egg, a glass of milk, a piece of stale bread with or without butter. The child must be taught never to drink milk in haste. It will be digested better when time is taken. The daily quantity of meat, preferably beef, to which gradually may be added lamb or chicken, may now be increased to one hundred grammes, and this is to be at two or three meals. The evening meal must be similar to that of the morning, and lighter than the mid-day meal. Neither at this age, nor later, should nervines, stimulants, condiments, coarse vegetables or salads, coffee, tea, wine, beer, play any part in children's diet. A piece of sugar, after a meal which is frugal but rich in albuminoids, will prove an agreeable and useful addition. Children from two to three years of age will get along well on four meals daily. Those who are a little older may do with three, provided they get once a day between meals a piece of bread and a drink of milk, made agreeable and more digestible

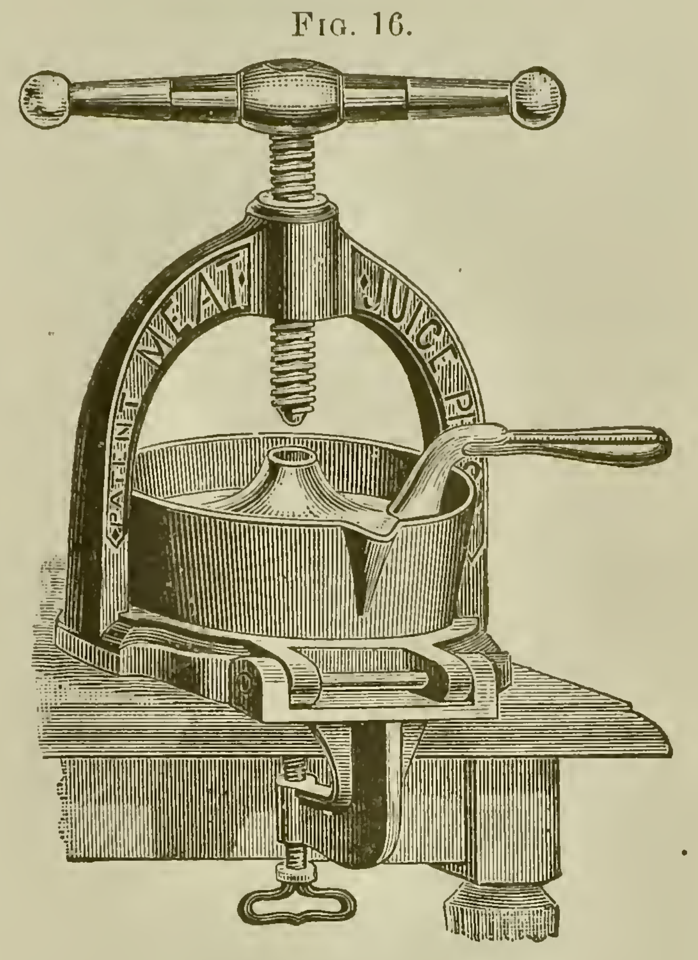
by the addition of a little salt. Before children are two years of age no vegetables in any quantity should be given to them. Small quantities may be given later on; they will be acceptable and be readily digested. As age advances, the diet should approximate, more and more, that of grown people. Altogether, there is no easier and no more grateful task than that which consists in accustoming children to a simple diet, and to shape their habits and their demands into harmony with those of nature from the first year of life."

Bear in mind, that if in the summer-time, a child takes more food than it can digest, this food is apt to decompose, act as an irritant, and possibly give rise to an inflammation that will end in summer complaint. Suppose, then, that a child has been weaned from the breast, and the object now is to gradually take it off the bottle or give it some additional food besides that which it takes in its bottle. We may presume that its bottle has been agreeing with it, but that for the last few weeks it has turned against it, as it were: it seems to crave more solid food. Certainly by the time it is twelve months old it could very well be given a small cupful of chicken-broth or beef-soup. Possibly before this time it has been given, instead of the usual bottle after waking from its mid-day nap, some boiled bread and milk; and now, instead of bread and milk, some chicken-broth, with a little dry toast soaked in it, can take the place of this meal, and the bread and milk be given for supper about six o'clock. In this way the "bill of fare" for three meals can be gradually mapped out, and the child permitted to masticate part of its food; this will aid the cutting of the teeth as well as increase its digestion. When a child takes bread and milk in this way it is always well to let it have an occasional drink of plain milk, and we must never forget that it also needs from time to time some fresh water. We repeat this constantly, as we want to impress upon mothers that much of the complaint about the constipation of bottle-fed babes comes from the want of drinking-water.

Very often during the course of weaning it is advisable to

give a child soups or, preferably, broths and beef-juice. The latter is frequently given in preference to soups, as it is readily digested and is most nutritious and blood-making.

Fig. 16.



Meat-juice press.

To make good beef-juice a piece of lean beef from the round, preferably of fresh meat and not that which has been frozen, should be used. Chop this fine and remove every shred of fat, heat slightly, and use a meat-press. A tablespoonful of juice thus expressed is enough for any infant at a time.

Of the ready-made extracts we have found Valentine's most reliable and also Rudisch's sarcopeptones.

Dr. Jacobi, writing of delicate children who suffer from dyspepsia caused by intestinal catarrh, says,—

" Most cases, in older children, bear boiled milk, strained oatmeal, barley gruel, stale wheat bread, and a few also raw beef. Some take nothing but boiled milk, or buttermilk, or koumiss. Many, particularly convalescents or adults, will tell you that they do not digest milk. That may be true, but then they gulped it down and it formed a large caseous cake in the stomach that was not afterwards dissolved and digested. They must *boil their milk* in the morning and *heat it several times* during the day almost to the boiling-point. They must add a small quantity of *table salt* to it; also, in case the stomach is very acid, some bicarbonate of sodium, or calcium, or magne-

sium. They must not drink their milk, but pour it upon a plate and sip it with a spoon. Thus prepared, they will digest it, particularly when it is not quite cold. In fact, many require their meals warm or hot.

"For the purpose of easier digestion, milk may be peptonized according to Fairchild's directions, or it may be rendered more digestible by the process recommended by Dr. Rudisch. This consists in mixing one part of dilute muriatic acid with two hundred and fifty parts of water and five hundred parts of raw milk, and then boiling it.

CHAPTER XXXV.

MENSTRUATION.

We will devote a few moments to the consideration of the changes which take place in girls at puberty, partly from the fact that at this time we are still within the period of the second or permanent dentition. Indeed, it will be noticed that at the very age when menstruation first shows itself, the girl is susceptible to all those functional disturbances that may be brought about by the cutting of the *four second molars*, a set of teeth that are developed anew, not replacing any of the milk-teeth. Sufficient attention has not been called to the disturbances caused by the pressure of the twelfth-year molars. These may show themselves in either dental neuralgia or, in fact, any form of trifacial neuralgia, gastric disorders, or mental peculiarities amounting to melancholia, or symptoms of acute meningeal irritation. No wonder, then, that it is most important that the young girl should be under the care of a mother properly instructed to guide her and guard her during this time. The natural impulse of her sex is towards sedentary occupation, seclusion, long dresses, and possibly her first real novel,—all of these in themselves pernicious: they weaken

her muscles, lessen her appetite, tend to constipation, and excite her brain.

It is scarcely necessary to mention the boys at this age. The out-door life that they lead, especially at the present time, when there is so much for a boy to do, tends to keep them in good physical condition, and renders them insusceptible to the many reflex disturbances which might otherwise exist. We quote from a paper upon this subject as follows:[1]

We all recognize the very great importance of all that tends towards muscular development in growing girls. They should be symmetrically developed, should have full chests, straight backs, and strong limbs. We should also urge the importance of clothing of light weight and loose fitting, the principal strain being on the shoulders, not on the waist and hips, and also the evil results of cramped, stooped positions in the schoolroom, eye-strain, and bad ventilation. We all urge these matters daily, and we know how little attention is paid to them. But there are certain forms of various disorders which occur about the time of the second dentition that deserve more than a passing notice. These are manifested either as chorea, (St. Vitus's dance), nervous excitement, such as night terrors, and various mental disturbances (misnamed hysteria), gastro-intestinal disorders, and evidences of malnutrition. The child will probably become languid, suffer with frontal headache, become peculiar in her disposition and show fits of temper, shun society of other children, lose her appetite, become despondent, and possibly develop a local twitching of some of the facial muscles. It is customary to say that this is all reflex, is possibly a warning that the system is undergoing some change preparatory to the menstrual functions,—that it is, in fact, a true hysteria. This may or may not be the case. Our own impression is that it is often due to the anæmia (impoverished blood) brought about by rapid growth and

[1] Published in the Medical and Surgical Reporter by Dr. J. M. Keating October 23, 1886.

development, with faulty assimilation and deficient oxygenation.

The nervous system seems to run riot, but this very excitement in itself is an evidence of the demand on the part of nature for a blood-supply which is nutritious and well oxygenated. All the exercise in the world, all the most nutritious and sustaining of foods, will have no effect until the digestive organs are made to perform their normal functions. If you examine the tongue you will find it coated; the breath is foul, the bowels are sluggish, the appetite is perverted, the child craves extraordinary articles of food, especially acids and sweets. She has a disgust for her regular meals. There is flatulence, cardiac palpitation, often asthma after exertion. The urine is either scanty and high-colored or very copious and light. If the menses have been established, they are scanty, colorless, and irregular, or there is a leucorrhœa. In these cases the recommendations of popular writers for gymnastics, friction, milk diet, etc., are admirable after the digestive organs have been cleared of their accumulation and the normal functions whipped into activity.

As far as the general treatment is concerned, the patient should be sponged every morning with tepid water; she should stand in a tub, and have a pitcher of it poured down her spine from the nape of her neck, and then be thoroughly rubbed into a glow with a soft Turkish towel. The breakfast should consist of warm milk or cocoa, a soft-boiled egg, a rare steak or chop, either oatmeal, cracked wheat, grits, or Indian meal alternating; bread and butter, *not hot cakes.* For dinner, soup, rare meat, fresh vegetables, ripe or stewed fruits. For supper, stewed fruits, bread and butter, warm milk or cocoa, neither tea nor coffee. She should retire early, and not be permitted to read at night. The supply of oxygen should come from out-door exercise, not an over-indulgence in walks or games that fatigue; let the school-hours be limited to the early part of the day, and avoid that abomination of preparing long lessons in the afternoon or evening for next day's recitations.

Moderate calisthenics, or massage, should be daily given. In about a week's time the girl will be able to bear iron alone, and the tincture of the chloride can be given in ten- or fifteen-drop doses for some time, or a chalybeate water can be given with arsenic. The digestive organs will now also tolerate milk in large quantities, provided it is of medium richness, is fresh, and given warm.

But this is not all. There are very many cases of a highly-nervous type which, despite the most careful treatment, will not improve at home. The constant association with parents of like temperament, however solicitous they may be in carrying out instructions, is of itself a cause of nervous irritation. It may be necessary to send such children from home, either to some relative, living possibly in the country or some distant city, or perhaps to some suburban or country boarding-school, where a thorough change of air and scene and the association with girls of a different temperament will work wonders.

The age at which menstruation appears cannot, of course, be definitely stated, so much depends upon climate, race, social position, and family peculiarities. Ordinarily, about the age of fourteen may be taken as the average in the temperate climate. Of course, whatever tends to early development, such as warm climate, in-door occupation, and especially among those whose occupation is sedentary or where it is attended with much mental excitement pertaining to literary pursuits or the excitement from the whirl of society life at too early an age, may bring about an early appearance; whereas the contrary may have a retarding effect.

The period at which this change to puberty takes place is marked by a series of phenomena which show the revolution undergone by the system. For some time previous the nervous system has felt the change; the temper becomes variable, at times uncertain. A girl who before was probably gay and boisterous in her deportment becomes timid and shy, easily embarrassed, the slightest cause making her blush, the knowledge

of which may add to her embarrassment. She may notice a gradually increasing development of her figure, which annoys her and makes her shun company. Her younger companions no longer have the same charm; involuntarily she prefers the society and dress of those older than herself. The watchful mother at once recognizes the cause which is bringing about these changes, and it is her duty to gain the confidence of her child and, without exciting her suspicions or disturbing her already uncertain nervous system, lead her to understand that she is no longer a child. In this way should the matter be explained to her by her mother. She is a woman, and it falls to the lot of all women who are in good health to have a certain monthly drain upon their system which is calculated to relieve the other organs of the body; and should it appear at any time, which it is now likely to do, she should avoid all things that might check it, and take certain precautions, as rest, etc., to secure its regular return, which should be painless. As this often in many cases comes unawares, certain precautions in clothing have to be taken; especially is this the case if the child should happen to be away from home at this time. Then, again, it is well for her to learn that the menstrual flow may at times, especially in delicate girls, be attended by severe pain, by nervous prostration, in fact, by a constitutional thunder-storm. There may be severe headache (frequent in such cases), colic,—this latter may be extremely severe; there may be giddiness, nausea, extreme nervousness, chills or creeps, excessive backache, all of which may come on suddenly, following some slight indiscretion in diet which tends to mislead the person as to its true cause.

When a young girl once distinctly understands that the object of her monthly flow is to keep her in good health,—and this surely is the light in which it should be presented to her,—she will readily understand that to secure the health which is heaven's greatest blessing she must be strictly guarded as to the care of herself. She should understand that after one appearance the periodicity of this function is not at once estab-

lished; there is frequently great irregularity in its return. It may last but a few hours and then return in fifteen days; it may be copious at first and then not return for two months or more. Instead of appearing, as it should, at the time of its expectation, it may appear as a bleeding from the nose, or it may be replaced by a diarrhœa or by a leucorrhœa.

There are certain signs which note the advance of a period, and it is well for the mother to impress upon her daughter to watch them carefully. Although the normal return of the period is calculated by the lunar month, really the idea that the moon exerts an influence upon this condition has no basis; this is shown by the fact that the day of return differs in women. Again, some have the normal return every thirty, others every twenty-five or twenty-eight days. The duration of the period also differs in most women; in some it lasts three or four days, in others eight or more. The quantity also differs; the range comprised within the area of health is widely spread. These facts are important to bear in mind; though should any deviation exist from that which the mother believes to be the normal condition, she should mention the fact to the family physician, and let him be the judge of its importance.

During this period of life there is a tendency in certain types of young girls to develop what is known as hysterical phenomena. Now, it is well to know that what is understood as hysteria by physicians is not merely those attacks which people call hysterics.

Physicians frequently hear this reply, "But, doctor, my daughter is not hysterical; she is of the most amiable disposition. I know her to be extremely brave and fearless." At the same time she may be a marked subject of hysterical vomiting, or some of the paralyses. It is a difficult matter to decide whether these troubles—which are usually termed reflex by doctors, because they are sympathetic or reflected from other organs through the chain they have in common, the delicate nervous system—are due to disturbance in the generative system or are simply the result of an associated weakness, of

which the disturbed menstruation, the pain, or the diminished quantity of the flow is another evidence.

In many cases the "womb-troubles," which may simply be irregularity of the function of menstruation. may be the cause, and rest, hot foot-baths, laxatives, etc., bring about a cure; or it may be due to weakness on the part of the individual, poor blood, deficient out-door employment, too much standing, as is so common with store-girls, and only yield to tonics, fresh air, ample diet, and exercise.

What is generally understood as hysteria by the non-professional is an outburst from the nervous system upon the slightest irritation, whether pleasurable or painful. To a certain extent this is independent of any disease or even disorder of the generative system, and is solely, we regret to have to say, due to bad "bringing up." Gentle, over-indulgent, *tactless* parents are themselves the cause of such a state of affairs.

It is not for us to study the cause of these changes in individuals that produce this function, nor to describe the anatomy and physiology of the organs that are engaged in it. It is merely necessary to insist upon the fact that normal menstruation should be painless, and that disturbances occurring at this time, whether in the form of local pain, headache, or lassitude, bear the same relation to normal menstruation that discomfort, nausea, and pain bear to healthy digestion. Just as dyspepsia is dependent upon indiscretion in diet, or weakened digestion from debility, so difficult or painful menstruation is the result of indiscretion at the time when care and watchfulness should be the rule, or it is the penalty paid for neglect at some earlier period.

Debility in early girlhood is one of the principal causes of pain when the function is established. It is usually found in rapidly-growing girls whose tastes have led them enthusiastically into literary pursuits, partly from a feeling on their part that their muscular weakness will prevent their taking pleasure in the rough out-door pleasures of their more robust companions, and partly from the extreme excitability of their nervous

system, which makes them at an early age noted for their brilliancy, and which will also exaggerate their liability to pain. Such children are easily recognized, and to them the watchful mother should give her careful attention in anticipation of what their development will bring forth. Their studies should be gently directed towards those pursuits that lead them out of doors; the muscular exercise involved in household duty should be gradually given them; habits of early rising and early to bed should be insisted upon. There should be a judicious division of their school-hours, the selection of well-ventilated and bright school-rooms, daily gymnastic exercise, swimming, riding, and walks,—not the aimless promenading the streets, but walks that are calculated to give both pleasure and profit. There is no better way of making healthy girls than to make the various branches of science, according to their taste, a part of their education; there is not a girl, or in fact any individual, who has not a latent taste which, with a little care, can be developed. If fond of drawing or painting, encourage it from the earliest moment; teach her to draw from nature, and she will spend hours in the open air. Botany, mineralogy, photography, will embrace the *répertoire* of an educated woman as well as Latin and Greek, and a woman's mind is capable of accommodating them all, if necessary.

Unfortunately, the present fashion is totally at variance, strange to say, with that of the ancient days of Greece and Rome. Nowadays it seems that a person can learn nothing except in an ill-ventilated school-room, in a barrel-hoop position. The philosophers of ancient days studied as hard as those of modern times, but they sought the solitude of the woods, and made their studies a pleasure instead of a task. It is not intense study that breaks so many down; it is the confined air, the sitting in a bent posture, the loss of appetite, the muscular weakness, and the poor blood that does the harm. We wish we could impress firmly upon mothers the importance of an erect carriage in young, growing girls. It is

not merely the case that stooping shoulders and curved spines make their daughters unattractive in appearance, but such conditions are absolutely a predisposing cause of disease; and we are satisfied from personal observation that such girls are fit subjects for tuberculosis and are always more or less affected with painful periods. To correct this before the age of puberty should be the aim of every mother. Make your girls straight from habit with shoulders well thrown back, and they will avoid many womb-troubles in the future. If out-door exercise does not seem to correct this habit, there are certain movements of the muscles,—light gymnastics,—which your family physician can tell you of, that are beneficial. One of the straightest and best-formed girls we ever saw—a picture of health—owed it all to her mother, who, noticing a gradual habit of stooping, required her to lie flat on her back on the floor without a pillow for one hour each day, while she read some entertaining book to her. Another matter, which is important in this connection, is the question of young girls wearing corsets. Fortunately, so much attention has been paid lately to the subject of dress in England that those whose opinion is most valuable have freely expressed themselves. We fully endorse the view of the London *Lancet* in an editorial, that corsets should not be worn by young women; their dress should always be made so as to give free and independent movement to every part of the body; their garments should be light in weight, and the burden should fall as much as possible on the shoulders; there should be no restriction of any part of the body, and if a girl's figure needs a corset to make it shapely, let her endeavor to accomplish the same end by the more natural means of muscular development, which will at the same time give health as well as beauty. A strong back is far better than a corset.

Young girls should know that when the time comes for their period they should avoid everything that would either postpone it or make it painful. If a horseback excursion has been fixed for that time, some excuse must be made; if a boat-

ing-party involve exposure to the chilling air, by all means avoid it. Swimming, climbing, tennis, should be interdicted at such times. In avoiding extremes, one does not merely mean the extreme of doing too much, but also that of doing too little. The lounging about one's bedroom, or spending the whole day sitting reading a novel, will be as apt to give trouble as the opposite extreme; it will make the circulation sluggish, tend to headache, make the liver torpid, give rise to indigestion, and weaken the system. If one is accustomed to moderate exercise, the daily avocations of life should not be interfered with; but heavy lifting, or over-fatigue in walking, or too long standing, riding, dancing, or tennis, should be carefully avoided.

We cannot lay too much stress on the importance of a careful regulation of the bowels, especially in its bearing upon the disorders of women. Every one knows the necessity of establishing a daily habit, from the fact that the wastes of the body which are discharged through the intestine, if allowed to remain, decompose, are reabsorbed, and produce a certain poisoned condition of the system, made evident by furred tongue, nausea, distaste for food, disagreeable taste in the mouth, headaches, bad complexion, pimples and other disorders of the skin, rendering the individual miserable to herself and others. Constipation also allows an accumulation to take place in the bowel, which by distending it will press upon the organs that lie in contact, and cause the extreme pain so common at times, especially in the left side. Nothing should interfere with this daily duty; *but no one should use powerful purgatives without consulting a physician.*

Of course, fresh, pure water is the best laxative we know of, and a proper amount should be taken each day, usually at meals. Then fruits, ripe, raw, or cooked, should not be forgotten, also fresh vegetables. The compound liquorice powder—a teaspoonful or more at night in milk or water—is a mild and excellent laxative. Occasionally upon rising in the morning a wineglassful of Rubinat-Condal water, Friedrichshall, Tarrant's aperient (teaspoonful), are excellent. The elixir cascara sagrada,

compound rhubarb pills, and Lady Webster pills are efficacious, but the latter should not be taken for any length of time nor immediately before menstruation. Whatever medicinal laxative is used, it should not be made a matter of daily routine; once or twice a week is sufficient, and alternating with an enema. Gluten (Health Food Co.) suppositories or glycerin suppositories are often useful. But whatever means is used, the child should be impressed with the importance of regularity as to the hour, and should never vary, never let anything else call her away; and parents should see that she has a comfortable closet to go to. Many a case of obstinate constipation has come from the dread of a cold out-house in an exposed yard.

The varieties of disordered menstruation are known as *amenorrhœa*, *dysmenorrhœa*, and *menorrhagia*; the former meaning absence of menstruation, the second difficult or painful menstruation, and the third an unusual flow at that time. Delayed menstruation—that is, where a young girl has reached, say, the age of nineteen without the appearance of the flow—is apt to give rise to much anxiety. If this is associated with evidences of tardy sexual development, it is not of itself alarming, and cases are on record where women have married and given birth to children without ever having menstruated. But it is always well, and especially if occasional signs are present of an attempt at the establishment of menstrual flow, not to allow this state of affairs to run on long. The family physician should be consulted, as the obstacle may be a mechanical one, or certain causes may exist which could be readily removed, but which otherwise might lead to serious disease. It is a recognized fact that the general mortality of women is increased at this period of life, and as soon as the establishment of the menstrual flow takes place the mortality shows a reduction. In the cases just mentioned it will be readily understood that to attempt to bring on the period by hot baths, or especially by the severe and forcible means of powerful drugs obtained without the doctor's consent, would be harmful, even fatal, and we regret to say that many such accidents happen.

Dr. Mathews Duncan thus writes of delayed menstruation: "Like other processes of development, that of the generative system admits of considerable variation in point of time, without of necessity passing the limits of health. Indeed, just as one child cuts its first tooth at seven months and another not till a year old, so one girl will menstruate at fourteen to fifteen, and another not till seventeen." Weakness or feebleness of constitution, more or less the result of city life, may be in itself another cause for this condition. We quote again from the above author:

"A girl previously in good health approaches the time of puberty; some of the changes characteristic of it take place: the form assumes the contour of womanhood, and nothing but the occurrence of menstruation is wanting to announce the completion of the change. The menses, however, do not show themselves, but the girl begins to suffer from frequent headaches; and the flushed face, frequent backache, pains in the lower portion of the abdomen, constipation, a furred tongue, and a full pulse, and all these signs of constitutional disorder undergo a marked increase at stated periods of about a month. At length menstruation occurs, though in all probability scantily, and attended with much pain, and then for several months together there is no sign of its return. The general health was at first probably not seriously disturbed, but by degrees the patient becomes habitually ailing, the appetite falls off, the powers of digestion are weakened, the strength becomes unequal to ordinary exertion, the pulse grows feeble and frequent, and the face itself assumes a pallid, sallow tinge, whence the term 'chlorosis,' 'green sickness,' has been selected;" and it might be added that such patients are not by any means necessarily thinner than usual. The great mistake most people make is to attribute this to disorder of the liver; they call it biliousness, and are apt to do harm by overdosing for this supposed condition. Again, they will imagine languor represents weakness, and immediately have recourse to some strong preparation of iron or the inevitable dose of quinine,

and then seem surprised that no improvement follows. It is the tonic influence of fresh air, healthful pursuits, exercise short of fatigue, and a nourishing, wholesome diet, of which milk should form the essential feature, that does most good, aided by those drugs which the investigation of the careful physician has warranted his suggesting to aid nature.

In the treatment of this form of difficult menstruation, which is applicable as well to those cases where, from one cause or another, the period has been missed by an ordinarily healthy girl, either from exposure to cold or the result of some shock to the system, or perhaps from the debility consequent upon convalescence from fever, or some such cause, Dr. Duncan says, "The patient should be kept quiet, and if there is any considerable suffering or much disturbance of the circulation, it is desirable that she remain in bed, while the hot hip-bath night and morning should be rendered still more stimulating, in cases where the local pain is not considerable, by the addition of some mustard." A gentle laxative should be administered, such as a dessertspoonful of the compound liquorice powder, or a teaspoonful of magnesia or phosphate of soda, or, better than all, probably, a dose of castor oil. Should there be much pain, hot applications to the abdomen, either in the form of a light meal poultice or a flannel bag of hops wrung out frequently in hot water, in addition to a hot foot-bath. Under no circumstances whatever should the powerful irritants sold in the drug-shops for such purposes be used; all drugs should be left for the physician to order. The use of hot teas is recommended,—ginger tea, tansy tea, etc.,—and by such means endeavor to encourage and not force the habit of menstruation. An excellent tea can be made from powdered *ginger*, *senna*, and *dulcamara;* it is laxative, and can be used every night with no bad effects.

The subject of pain during this time next claims our attention. At times it is so intense as to demand immediate relief; and frequently persons, especially those who have not the mother's care or her experience to guide them, will put off

month after month the consultation with their physician, hoping that time will bring relief, and endeavor by various means to struggle through the periods which to them bring renewed horrors, and which finally wear them out by the constant effort to withstand the pain. And what means do they adopt to obtain relief? We regret to say it, little reflection is given as to the cause of the disturbance. The period once over, they assume the same habits which have resulted in making a function normally painless fraught with pain; the same giddy life of society or the same over-indulgence in mental excitement and all that tends to enervate both body and mind. The cause of their trouble never for a moment attracts their serious attention; the treatment that they apply for their relief consists only in that which dulls their sensibility and deadens their nervous system. Alcohol in some form, whether gin or brandy, and opium, bromides, or chloral, are used in large amounts, and made to play the part of the greatest curse of a household.

We do not mean to say that all those who suffer do so on account of indiscretion, nor do we believe that the most rigorous and careful living would at once relieve the tendencies to periodical pain; but we cannot dwell forcibly enough upon the fact that those whose temperament is such that the slightest cause will result in hours of torture, can be in time relieved by rest, nutritious diet, and careful living.

If there be one cause more frequent than others to which the agony of the period is due, it is constipation. When the question is asked, they will positively assert that their bowels are moved daily with regularity; but probably a very small portion of the matter contained is passed, and a large amount remains accumulated, which presses against the tender, congested ovary as a morsel of food or a filling presses on the sensitive nerve of an inflamed tooth and causes the severest form of neuralgia. We have not gone deeply into this subject, but have been sufficiently explicit to enable any one to understand this matter so as to prevent it. It is on this account that

enemas are so effectual at times, and especially if a teaspoonful or two of tincture of assafœtida is added to the warm water; but one of the gravest of mistakes is to attempt to treat such cases by strong purgatives without the advice of a physician ; a gentle laxative will encourage nature, a purgative may bring about a very serious inflammation. By the frightful abuse of stimulants, though the habit is brought about without a thought on the part of the sufferer, she is doing herself a most grievous wrong; month after month, each time increasing the dose, she will have recourse to her bottle of gin, her mixture of morphia, or her bottle of chloral, until finally she recognizes the unfortunate fact that she has become a victim to its use. It is far better to begin by a firm determination to avoid them at the onset.

You want to relieve a congestion and bring on the flow. To do this, apply hot cloths or poultices to the abdomen, hot salt-bags to the back, a hot hip-bath and foot-bath, rest in bed or lounging around one's room in loose clothing; or if the pain is not too severe, a moderate walk, or an agreeable change that will occupy the mind, and calm the nervous system by pleasant thoughts. The next thing should be the administration of a laxative, and probably the best of all is an enema which will secure the thorough removal of matter that may be the cause of trouble. A thin gruel may be used, made of oatmeal and strained. Of this about a pint should be used, or of the ordinary Castile soap and water. If mothers who are solicitous about the well-being of their daughters would gain their confidence at these times. and minister to them during their hours of pain, applying those remedies which their experience has proved valuable, there would be far less suffering and far less danger of the habitual use of drugs that can be hidden in some convenient closet and taken *ad libitum.* Frequently the pain is so severe that a physician is called in, who gives a prescription—a strong anodyne in a pleasing mixture—or suppositories of opium. The relief is magical; the patient falls into a quiet sleep, and, barring the nausea and headache of the

following day, is surprised at the result. A copy of the prescription is obtained, and it serves ever after for herself and friends. *This is wrong*, and every right-minded woman should feel that to expose herself to a habit of this kind is to sacrifice her life to a slavery which ends only in the grave. It is far better to consult the family physician at once and tell him frankly and without hesitation what the trouble is. It is an old story to him; he has listened to many lectures upon it, he has recited your symptoms in class, he has heard the tale often told, until it has assumed a very monotonous sound. You imagine that the matter is too delicate a one to speak of without embarrassment, but you forget that the position your family physician holds towards you is one so intimate and confidential, so sacred in its associations, that it has received the sanction of heaven itself, as you are bidden to obey him.

The severest form of painful menstruation is that which occurs in young women whose period has not appeared till a much later age than usual. "The pain in such cases precedes menstruation for a day or two, generally reaches its greatest intensity in the course of the first thirty-six hours of the flow, being sometimes so intense that the patient writhes in agony, and then often by degrees subsides, though it does not cease entirely till the period is over, though severest in the uterine and pelvic regions (lower part of the abdomen). The pain is not generally limited to these situations, but is experienced also in the back and loins, and shoots down the inside of the thigh. The pain, too, is aggravated at intervals, and becomes paroxysmal like colic; and the whole abdominal surface is so tender as scarcely to bear the slightest touch. Intense headache is very frequent, often confined to one side of the head; and in other cases the stomach is disordered and the patient distressed by constant nausea and vomiting." The treatment may be summed up as follows: absolute rest before the period is expected, avoidance of any active enterprise, running up- and down-stairs, horseback exercise, tennis, long walks, and sudden changes of temperature; to have the bowels moved

freely by compound liquorice powder or some such simple laxative. Exposúre to cold is very apt to bring this on, and it is especially liable to occur in girls who sit out of doors after dark in their thin summer clothing, and thus allow the damp, cool air after nightfall to chill the surface before the expected period. This is frequently noticed at the sea-shore or mountain resorts. How many of the gayly-dressed beauties, in their lightest clothing, will dance a waltz through and then rush frantically for a walk on the porch, and will next day suffer tortures in their rooms for their imprudence, while their friends marvel at the number of sick headaches they seem to have! Sleep, rest,—absolute rest in bed,—hot foot-baths prolonged and frequently repeated, a strong, hot, well-seasoned cup of beef-tea, are the best means of procuring relief. If the pain still continue, a hot lemonade with a dessertspoonful of sweet spirits of nitre to the tumblerful. The applications to the surface of the abdomen are usually valuable on account of their warmth; a mush poultice well sprinkled with laudanum is useful, or a bag of hops, quilted, wrung out frequently in hot water and wet with the spirits of chloroform. Frequently a hot salt bag to the back will give relief, or the rubber bag filled with hot water. "In some of the cases, the discharge, having continued for a few hours, ceases and then comes on again, while, though scanty, it is intermixed with small 'clots.'"

In these cases anodynes no longer furnish the ready relief which follows their administration in the neuralgic form. There are so many causes for this form of dysmenorrhœa that the physician should at once be consulted, in order that the proper treatment may be instituted before the next period. Laxatives, such as the various purgative waters, give relief in these cases; the granular effervescent Carlsbad salt, a tablespoonful in water, may be taken, or a claret glass of Hunyadi water, or Friedrichshall water with an equal part of hot water. A free purgative action of the bowels should be the first thing to accomplish. If the patient is away from a physician, she should take a *tablespoonful* of *liquor ammoniæ acetatis* during

the painful time, when the flow is scanty, in some weak, hot lemonade every two hours, until three or four doses have been taken. Should the pain still remain severe, notwithstanding these domestic remedies, the physician should be sent for and the matter fully explained to him.

It is so obviously the mother's duty to be the confidante of her child while nature is establishing these physiological processes, that we have felt the necessity of adding this chapter to our book. Most of the disorders of the nervous system which attend this time of life are directly traceable to indiscretions which are the result of ignorance. The intellectual girl of sedentary habit offends nature by retarding her physical development. The thoughtless enthusiast lays the seed of future disorders by an ignorance which the timely admonition of a watchful mother would avoid.

CHAPTER XXXVI.

EDUCATION AND SCHOOL-HYGIENE.

The question of education is a most important one, and it will not be long after the child ceases to need the ever-careful watchfulness of its nurse before that problem will present itself. The *Kindergarten* system serves as an admirable initiation to more elaborate methods, and serves to interest the little one while it gradually educates its mind in the proper methods of thought, and teaches it to observe, reason, and express its thoughts. Education does not mean mere book-learning; it enters, or should do so (alas! in how many households this part is totally disregarded!), into the training of a child from the date of its dawning reason. The mental discipline from obedience, from example, from proper surroundings, constitutes the first great educational step. Unfortunately, in this country the ambition of parents or the political manage-

ment of public schools educates children of the working classes above their sphere in life. Not for a moment do we mean that persons can *know* too much, but they can obtain a veneering of dangerous knowledge by reason of its superficiality, which only renders them unfit to assume positions attainable by knowledge, and makes them too proud to labor in meritorious work beneath their dignity. "Knowledge is power," but "a little knowledge is a dangerous thing."

Mental and physical development should go hand in hand; overbalance in favor of the first will lead to disease; of the latter, to brutality. A mother should remember that "the boy is father of the man;" the child's early training and discipline will be the key-note of its after-life. The lessons of the nursery, by its mother's knee, are the beacon light of its conscience in after-years; the seed then sown bears fruit in manhood. "A sound mind in a sound body." Dr. D. F. Lincoln thus writes[1] in regard to school-hygiene:

"Measured by the standard of the German schools, our children do not have much overwork to complain of. Ten hours a day, study and recitation, is a common requirement in gymnasia (classical schools) for boys of ten to fourteen years of age; with us the work done in 'high schools' from the age of twelve to eighteen varies from six to about seven and a half hours for average pupils; in colleges it is about eight hours, and at West Point and Annapolis nine or ten at most. These requirements for American schools are not excessive. But it is beyond a doubt that we compel younger children to attend too long. If a child enters a primary school at five, he is kept three hours in the morning and two in the afternoon, —or fully two hours too long for his good. He is kept in, nominally at work, far beyond the period for which he has the power to use his mind at the work. The researches of Edwin Chadwick have furnished us with data governing this point,

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[1] Keating's Cyclopædia of the Diseases of Children, vol. iv. We take pleasure in quoting freely from this valuable article.

which have never been set aside. He states that a child from five to seven years old is able to attend to one subject for about fifteen minutes, which should be the length of a lesson; from seven to ten years, about twenty minutes; from ten to twelve years, about twenty-five minutes; from twelve to sixteen or eighteen years, about thirty minutes. The total power of attention for one day is somewhat in proportion to this. It is a disgrace to our communities that they insist on having the little ones sent, more to be taken care of than taught, for the same number of hours that make a banker's day. Every minute in school, after their power of attention is exhausted, is given to forming the habit of inattention, which is clear loss to education. That health must suffer, is certain.

"The city of St. Louis fixes the age for admission at seven; but there are numerous kindergartens which take younger children. The kindergarten is one of the best charities of modern times; it teaches neglected children habits of neatness, order, punctuality, civility; feeds, washes, and clothes them when necessary; keeps them half a day in an atmosphere of physical purity and health, and must be classed as the best evidence of what schools may do for hygiene. On the other hand, the kindergartens for children of wealthy parents are not wholly free from the charge of over-stimulating their pupils. There is a constant tendency among the new teachers to urge and arouse children who are doing well enough already: I quote the words of a very experienced senior teacher. Some children, in fact, are too much aroused, and have to be removed; but the danger is understood; and, on the whole, these children also receive moral lessons that are of inestimable value.

"The fault of the old-fashioned school was in neglecting the pupil's understanding of the subject and his interest in it. These points have now been so thoroughly studied that it seems as if lessons had become far too interesting for some children. A bright boy, making no progress in a common school, is transferred to a 'Quincy' school and becomes devoted

to study, but he has to be taken out every few months to rest his brain. The teacher ought of right to be taken out for the same purpose, but she holds out—by the aid of coffee.

"A very exaggerated notion is entertained by some parents regarding the value of primary work: as if children at the age of five could be said to be students in the proper sense of the word. Schooling at that age means something radically different from what comes later. In the words of W. T. Harris, 'We do not look so much to the gain in intellectual possessions as to the training of the will into correct habits, during the years previous to the seventh.'[1] In protest against the popular delusion about *losing no time*, there is an occasional expression of individual will, like this: 'I kept my little girl out of school till she was eight (or ten) years old, and now she is up with the rest.' There is a certain number of bright excitable children who are benefited by this postponement of school-life. . . . But the effects of *anxiety* are worse than those of carrying heavy loads.

"It is a universal complaint among teachers that girls ruin their health by social dissipation. The complaint is justified by the facts, and it applies to almost all ages in school. The fault is in the age we live in, which exacts too much and too early display, and expresses the height of its contempt by the word 'slow.'

"The parents of school-boys and school-girls ought to consider that 'society' has not yet begun for them,—that school is entitled to their entire strength; in return for which, the school ought to see that the children grow into the possession of firm health. Many boarding-schools deserve praise for their success in this matter, and it often happens that children of rich and indulgent parents are never quite well except when at boarding-school, where regular hours are kept and sweetmeats are not allowed to be received from home. A return to old-fashioned, English notions about the value of

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[1] St. Louis School Report, 1872–73, p. 18.

play seems to be making, also, in boys' schools. But it is the girls that give most anxiety, because of their readiness to undertake double tasks. . . .

"DYSPEPSIA.

"This is an established national trait of Americans, and a familiar symptom of overwork at school. The first point to be noticed here is the fact that it is not (as seems to be popularly supposed) a local trouble, to be cured by some doses of medicine, but a symptom of general want of force in the system, to be cured by fresh air, exercise, food, sleep, and good regimen in general.

"The school is responsible for dyspepsia, in some cases, by interfering with the pupils' opportunities for regular meals. The old plan gave two hours of free time at noon, during which children had a good dinner; the new plan, already introduced into high schools and beginning to creep into those of lower grade, keeps the child from nine to two o'clock, with no food except the wretched 'lunch' of cake and sweets, dismissing him in an exhausted state from the day's work, to seek for more cake or pie in the cupboard, or else to await the family supper or dinner with what patience he may command.

"The privilege of having a whole afternoon to one's self is so highly esteemed that we shall not probably see a return to the old plan. A modification, however, by which an hour's recess is given midway in the session affords ample time for the consumption of a proper lunch, as is the custom in one of the Chicago fitting-schools.

"Children often lose appetite during the course of a school year, nor is this always evidence of overpressure, but sometimes of mere confinement to the house and want of exercise. Some, particularly girls, have no appetite for breakfast: they must not be allowed to indulge this want of appetite. Very many think it worse to be tardy than to lose a breakfast: they perhaps are lazy at times in the morning, or have been up late at an entertainment; or they may live a great way

from school, and may leave home before the family are quite ready for breakfast. Many teachers notice children occasionally coming to school in a famished state from such causes; it is a duty to send them home at once, with advice.

"Other children there are in whom this failure of appetite is a warning to investigate the day's doings. It is fully as bad when children acquire a habit of depending on a cup of tea or coffee at breakfast.

"HEADACHE.

"The causes of headache are as various as those of dyspepsia.

"If there is distinct excess of mental work, this will often produce increased irritability of the brain, and disturbances in the circulation of that organ. There is not a very great amount of this overwork in our own schools, perhaps. In Germany, and in the countries that have formed their educational systems upon her models, excessive study is the rule, and the result is coming to light in some of the more recent statistical reports, as well as in a general popular protest against the cruel exactions that are made. . . .

"The headaches suffered by hypermetropic [far-sighted] children are cured at once by suitable (convex) glasses, and by no other treatment. The public ought to become aware of this rather common class of cases. The patients are literally unable to accommodate their eyes for reading without hurtful efforts.

"NERVOUS DERANGEMENT.

"The term nervous derangement covers a wide field. One of the common forms among school-children is sleeplessness, or restless sleep disturbed by dreams. Chorea [St. Vitus's dance] is brought on in some predisposed children by school-work. Either of these conditions should give instant warning.

"A fair statement of the general condition of city public-school children has been given by Dr. C. F. Folsom:[1] 'Pale

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[1] Six Lectures on School-Hygiene, Ginn & Co., 1885.

faces, languid work, poor appetite, disturbed sleep, headache, and what is vaguely called nervousness, are more common among them than they should be among children of their ages. I doubt whether there is an exaggerated prevalence of manifest or well-marked diseases of the nervous system among them. If due to the school-drill, my impression is that they come for the most part later in life, after the children have left school, and because of constitutions weakened during the school-years, instead of strengthened, as they should be.'

"The impression which the appearance of city school-children made on the writer, when a visitor, precisely corresponded with the above statement.

"Some children are extremely sensitive to the influence of their comrades. They are unfit to mingle in a crowd; they lose the power of expressing themselves in reciting; their manner betrays mental pain and constraint. The rigid air of discipline in large schools keeps many in an unnatural state. Young girls entering college sometimes suffer greatly from being obliged to live in the midst of crowds, with so much less of personal freedom than young men enjoy under like circumstances.

"CHOREA.

"St. Vitus's dance is mainly a disease of the time of bodily development: the greater part of the cases occur from the sixth to the fifteenth year, which includes the second dentition and puberty. It belongs to the class of diseases which may spread by psychical contagion among children. Among the first symptoms is a change of temper from cheerfulness to fretfulness or apathy, and along with this the powers of attention and memory fail in a way which the teacher may be the first to notice. A child suffering from chorea, therefore, is unfitted for associating with school-children or performing school-work; and the first step in the treatment must be to remove it from school and stop all head-work at home. There is a certain number of children who possess a predisposition to complaints

of this sort, and are not fit members of ordinary schools, with the strain on the faculties which seems a necessary attendant upon our system of large classes and fixed tasks. Such children may develop well, if educated quietly and with much open-air freedom.

"EPILEPSY.

"Children liable to attacks of epileptic fits are not proper inmates of school-houses. They are often backward, or even feeble-minded. They are usually peculiar in temper,—easily excited and falling into ungovernable rages, given to lying, and licentious. It is impossible to manage them by the ordinary course of discipline; they are not understood by the average teacher, and do not belong in the common school, but in those special establishments where their nature is understood. Besides the moral danger to which their presence exposes the scholars, the occurrence of an attack in the presence of young people is a thing to be greatly dreaded. Fright is a recognized cause of epilepsy in well persons; and a person in a fit is a spectacle quite ugly enough to frighten others into fits. Add to this the facts that childhood is eminently susceptible to nervous impressions, whether of fright or otherwise, and that most cases of epilepsy originate in childhood.

"Of epilepsy as a possible consequence of overwork in school, little may be said. The connection 'is not proved, but we cannot wholly reject the possibility of it.'[1]

"NEURASTHENIA, OR BREAK-DOWN.

"A complete failure of strength, bodily and mental, is sometimes the reward of excessive zeal in study. A partial breakdown, implying a year's semi-illness, with a recovery to one-half the former working-powers, is rather common. High schools, normal schools, and colleges furnish the cases. . . .

"Break-down is notoriously common in young women, and

[1] Nothnagel, in Ziemssen's Cyclopædia.

excess of work or some other distinct cause is usually traceable. It may occur shortly after the graduation, rather unexpectedly.

" BACKACHE.

" This is not the name of a disease, but is used here as designating a class of cases described with admirable vigor by Haward,[1]—cases, not of spinal disease, nor of uterine disorder, but of over-fatigue.

" 'It is very common,' says Haward, 'to see cases in which such symptoms (backache and weakness of the spinal muscles) are the more obvious evidences of over-fatigue, and in which a careful examination will reveal other signs of the same evil. This is especially the case with young girls of feeble circulation (evidenced by their cold hands and feet), whose enthusiasm for work is in excess of their physical powers. They rise early, study before breakfast, sit long hours before the piano or easel, or attend long and frequent religious services, retire to rest late, take insufficient or innutritious food, and still further exhaust themselves by irregular and fatiguing exercise undertaken with the idea of " working off the effect of over-study." At last comes the break-down; the poor girl who has been cramming into one day the work of six, and who has been held up by the fond and foolish mother as an example of industry, piety, and intellectual excellence, finds herself exhausted and ill. She cannot sit upright, her back aches terribly, her brain feels weak, and in her depression and anxiety she thinks she has some serious spinal disease.'

" DISORDERED MENSES.

" Painful or irregular menstruation is to be classed with neuralgia, anæmia, headache, and the like, as a symptom of over-pressure.

" In 1873 a work was published which attracted universal attention in America, attacking, as it seemed to do, some cherished

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[1] Treatise on Orthopædic Surgery, p. 148.

features in American education. The book, Dr. Clarke's 'Sex in Education,' was certainly written with the intention of stirring up discussion; and it succeeded. The author affirmed that he had seen vast numbers of women whose health had broken down, as he thought, owing to neglect of the menstrual function at the formative period, and especially owing to over-study, or, rather, uninterrupted study, during this period. The purpose was to show that girls needed special care while the menses were developing; that the healthy performance of the function is so important that no sacrifices are too great which further its proper establishment; that for many girls hard study was one of the worst things that could be done during the monthly periods; that a rest was imperatively called for by nature, and must be granted 'for a single day, for two or three days, or half-work for two or three days.' The inference drawn from these important truisms was that girls cannot stand the strain of working side by side with boys in high schools and colleges, where it seems necessary to treat all alike on every day of the year. If Dr. Clarke had refrained from certain galling expressions, the tone of the rejoinders would have been milder; but his end was attained, and the public was the gainer from the prominence given to the question.

"The replies made to Dr. Clarke showed that many women are, apparently, complete exceptions to his rule in regard to an absolute need of rest every month. One such exceptional lady, in her book, incidentally states that *she* has stood ten hours a day in a store for five years, without the least trouble; a remark which may be improved by us as the occasion of proposing a new rule for mixed high schools,—namely, that in the upper classes *girls ought never to rise in recitation.* Opinions may certainly differ on the point of rules for school-government, but at this day there are many masters who are accustomed to make allowance for girls, even to the extent of never giving penalties for absence. If this does not meet the case, the remedy ought to work through the feminine tact of assistants. A little want of tact may spoil the arrangement; a word of

complaint about frequent absences may appeal to the pride of the girls in such a way that they will accept no more favors. It was Clarke's opinion that girls could get through as much work as boys, on the whole, 'working in their own way.'

"The principal of the St. Louis Normal School states [1] that 'excuses relieving the students temporarily from work are granted, whenever asked for on account of sickness, without further explanation; and I may say that it is my belief that this privilege has been of great advantage.' The school in question is exclusively for young women.

"CONSUMPTION.

"There is reason for believing that this disease is rather frequently caused by school-influences, though it would be hard to say how frequently. The story of the cases brings to mind those of 'general break-down,'—the familiar 'nervous prostration;' the general list of causes is the same,—bad air, continued overwork without rest for repair of waste,—and the difference in the effect is doubtless largely due to hereditary predisposition.

"Bad air is notoriously influential in causing consumption. 'The impure condition of the air of our houses, be they factories, public buildings, or dwelling-houses, has much to do with the great prevalence of such diseases as phthisis pulmonalis, bronchitis, and pneumonia, which together make up nearly one-quarter of the total mortality. . . . Unventilated and crowded workshops and schools are, moreover, the nurseries of strumous diseases in general, which sap the strength of the community.'

"The following observations by Parkes bear upon this point: 'Usually a person who is compelled to breathe such an atmosphere [vitiated by respiration] is at the same time sedentary, and perhaps remains in a constrained position for several hours, or possibly is also under-fed or intemperate. But, allowing the fullest effect to all other agencies, there is no

[1] Report of Public Schools for 1878–79.

doubt that the breathing the vitiated atmosphere of respiration has a most injurious effect on the health. Persons soon become pale, and partially lose their appetite, and after a time decline in muscular strength and spirits. The aëration and nutrition of the blood seem to be interfered with, and the general tone of the system falls below par. Of special diseases it appears pretty clearly that pulmonary affections are more common. Such persons do certainly appear to furnish a most undue percentage of phthisical cases,—that is, of destructive lung-disease of some kind.'

"Carmichael (1810) and Neil Arnott (1832) describe cases where the diet of schools was excellent, and the only causes for the excessive phthisis were the foul air and the want of exercise. In fact, medical testimony lies all in the same direction. The presence of dust in the air is a very frequent cause of bronchitis, asthma, or pneumonia in various trades, and ought to be mentioned here. Consumption has been a terrible scourge to the British and other foreign armies, chiefly owing to the impure air of the barracks. The same is true of the navy; of prisons in general; of monkeys in menageries, and other unhappy confined creatures.

"In America the experience of Prof. H. I. Bowditch as a specialist has led him to utter repeated warnings to the misguided parents who urge their weakly children beyond their powers. The following quotation outlines the history of this class of cases:

"'A young person, male or female, walks into my study for the purpose of consultation in regard to health. I observe great paleness of face, extreme emaciation, and trembling steps, combined with a slight cough, and evidently more or less difficulty of breath. These, if combined with a certain intellectual expression of the face, almost immediately enable me to foreshadow a history somewhat as follows:

"'Stimulated by ambition to be in the front rank of scholarship, and desiring, owing to poverty or the known wishes of parents, to obtain rapidly an education, the poor, scarcely de-

veloped child has been laboring for months, always overworking intellectually, and at times also physically. Perhaps the victim has been carried many miles daily to and from school. Study at school, in the cars, and after return at night, sometimes twelve to fourteen hours, has been the daily rule. [In one case the girl went forty miles daily to and from school, in all weather, winter and summer.]

"'Of course, utter prostration is the result. The appetite fails or becomes capricious under severe fatigue and irregularity of meals. Gradually a cough is noticed, and it is thought "a cold has been taken." . . .

"'The cough and the educational race continue on together. Finally a failure of strength manifests itself, and then, for the first time, the parents begin to look with concern at the appearance of their child. But neither child nor parent thinks of giving up school. Perhaps it is towards the end of the term. "Only a few weeks more," and the coveted prize will be gained, and then rest and cure can be attempted. . . . At last the long-wished-for goal is reached. The first honors are gained, but they are now of little comfort, for all strength, which has been artificially kept up by the excitement of the race, suddenly leave the patient, and the pupil does nothing afterwards. . . . All ideas of cure, or even of partial relief, have disappeared.' . . .

"It is important to note that the blame for such abuse of life is placed upon the parents, rather than upon any stimulus supplied by the teachers.

"If a child has hereditary tendencies to consumption, it is imperatively necessary to select 'a proper, reasonable, well-ventilated school (especially one in which the frequent opening of windows is avoided). No overwork of mind or body should be permitted. If the health fail at all, absolute removal from school is required; travel or anything else should be undertaken that will interest and keep the pupil from books and out of doors, and let the education, so called, take care of itself.'

"In another place the same eminent authority remarks that

'in a consumptive family the steadfast rule should be, *that the mind be wholly subservient to the body's welfare.*'

"In a report on the causes or antecedents of consumption, the opinions of two hundred and ten correspondents were summed up as follows. The question having been put, 'Is consumption ever caused by over-study at school or college?' the answer 'yes' was given by one hundred and forty-six; 'yes, indirectly,' by seven; 'no,' by twenty-one; 'doubtful,' by ten; and twenty-six gave no answer.

"The circumstance that residence on a damp soil is one of the most powerful predisposing agents to consumption ought to have its influence when the site of the school-house is selected.

"Here we may end the description of the ailments commonly grouped together when the effects of overwork are described. Spinal deformity and near-sight are susceptible of being classified with these, for weakness is an element in both. It is more suitable, on the whole, to describe them separately, on account both of their special importance and of their mechanical relations to desks and seats.

"SPINAL DEFORMITIES.

"Under this heading belong two distinct affections,—lateral curvature and round shoulders. With the latter is associated the 'hollow back' or excessive curve at the loins. Lateral curvature is the object of our present study.

"*Lateral curvature*, in the popular eye, is an inelegance of person, surmountable by the aid of the dress-maker. The physician sees in it a consequence and a cause of low vitality.

"The great majority of cases of this curvature originate in children from the age of five or six upward, and in young persons who have lately been in school. This might be thought a mere coincidence; for the school-period is necessarily the period of development, and the curvature is a disease of development. But there is evidence that school work and

customs are genuine causes,—not by any means the sole causes, but rather prominent ones.

"The origin of lateral curvature depends chiefly on two things,—weakness of the muscles which support the spine, and bad positions of the body. Weakness, however, is not a necessary circumstance, though an extremely common and often important one. A bad position constantly maintained will twist the most athletic frame. A very muscular person may be forced to stand in a one-sided position by the circumstance of having one leg shorter than the other. Fig. 17 gives a rough but sufficient idea of the way in which the body is supported on the legs. If the right leg is shortened (Fig. 18), the pelvis or hip-bone will be tilted to the right, and the lower part of the spinal column, being firmly attached to the pelvis, will tilt with it. If the whole spine remained straight, the person would be thrown off his balance; the spine must therefore curve to the left at a higher part; and furthermore, to make up for the overweight thrown to the right below, there occurs a 'compensating' curve to the left at the height of the shoulders. In addition to this, the spine is in parts twisted, with a gimlet-motion; but this is not represented here.

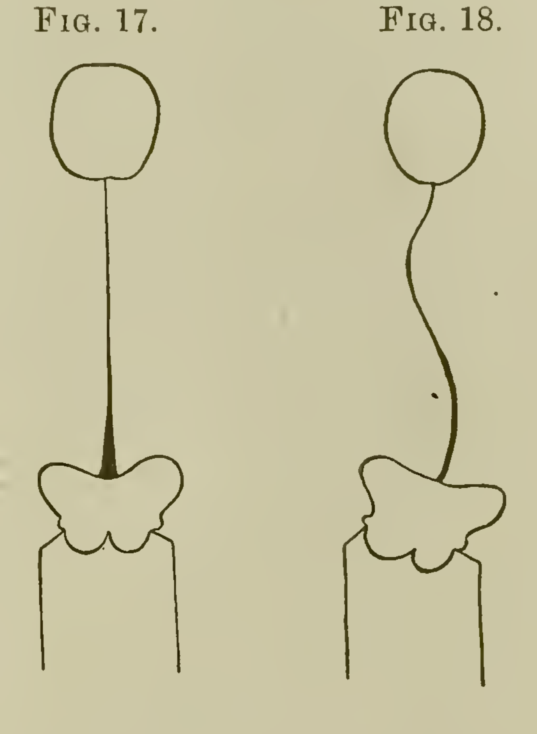


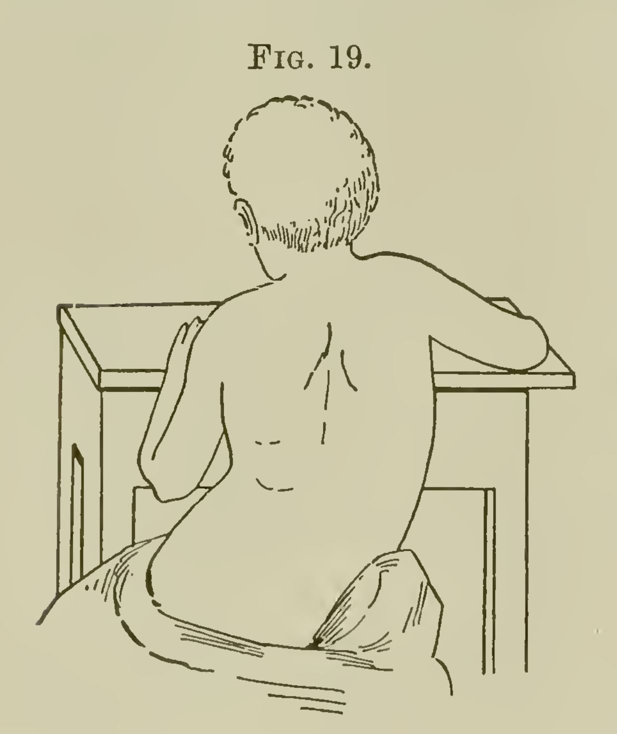
Fig. 17. Fig. 18.

"A similar thing happens when children stand on one leg,—a position which practically shortens the other leg. 'A most pernicious habit, and one which is very often to be noticed in school-girls (I think I have observed it in girls more frequently than in boys), is that while we are talking to them, or during recitations, especially if they are much interested in what is going on, they are standing on one leg. The position is assumed

involuntarily, and it is always, or almost always, one and the same leg on which the weight is thrown. The effect of this is easily understood: one side of the pelvis is lifted up, curving the spine in the loins; the opposite leg is advanced in front of the other, twisting the pelvis and rotating the vertebræ. Of course the curve of compensation takes place between the shoulders. One is depressed, the shoulder-blade gradually projecting, and with the change, and in fact assisting to produce it, occurs the spiral twist.'[1]

"Many curvatures begin in the region of the shoulders; of these, beyond doubt, the cause is largely to be found in false positions in writing or drawing. 'I have visited rooms in which drawing was taught,' writes Brown, 'where all,—male and female,—with scarcely an exception, were sitting in a position not only to curve but to twist or rotate the spine, and in most the position was such as to produce a triple curve.' The deformed attitudes (so to speak) assumed in writing are powerfully described by Liebreich. Such occupations can hardly be conducted in entirely normal postures, but a great deal can be done to correct the grosser faults. One cause of the defect is the raising of the right shoulder by a high desk or table, as is seen in the sketch (Fig. 19) borrowed from Guillaume.

Fig. 19.



"Another frequent cause exists when the desk is too far from the seat, and the pupil is forced to bend over his work in an unbalanced posture, which cannot be maintained; in a short time, if not at once, he leans one side forward, puts elbow

[1] Lecture before the American Social Science Association, 1879.

on desk or knee, and head on hand, and gets his spine into the shape of a corkscrew.

"It is desirable that every person directing or teaching a school should have a notion of the proportions suitable for desks and seats. Farther on, this matter is illustrated with a few representative figures. But it is of the greatest consequence to remember that no seats or desks can be devised which will remove the *original weakness of muscle*, which ranks as one of the two chief causes, and would by many be named as the one important cause. Children cannot be made strong by supports. . . .

"That muscular weakness is a chief cause is further shown by the treatment which is successful, consisting essentially of prolonged and perfect *rest* to the weak muscles, by reclining, combined with occasional moderate yet active *exertion* of the muscles by appropriate exercises. Cases that are not far advanced may do well by using scientifically directed gymnastics. Some need never be told that they have 'anything the matter with the spine,' provided they can be got to change their habits of living.

"These principles need to be applied to the *prevention* of spinal curvature in schools. The preventive treatment should consist, when possible, of very varied muscular activity of an active sort, taken at proper times. The best kinds are out-door games of an athletic tendency,—leaping, running, coasting, skating, climbing, and all sorts of 'hard play.' For boys, wrestling, foot-ball, and boxing, and many more, may be added. No doubt, children must be kept from excesses, such as trying to make a high score with the skipping-rope. Some sports have a tendency to develop curvature,—croquet, decidedly; tennis,—when played with one hand; base-ball; horse-back-riding on a one-sided saddle. Ladies should use two saddles, one for each side alternately. Sports liberally indulged in are, with this class of exceptions, the usual and natural preventive of spinal curvature among boys; if girls played out of doors as boys do, they would have little trouble of that sort.

"The physical indolence of girls, however we may deplore it, is not to be overcome at once. It arises in part from their unwillingness to assert themselves as boys do; their readiness to submit to custom; and their power of sacrificing comfort (*i.e.*, health) for the sake of propriety. The misguided sense of decorum, which prevents even walking in many cases, is the same feeling that, neglecting certain of the lower functions of the body, leads to the prevalent habit of constipation, and occasionally to disease of the bladder. Every argument, therefore, in favor of bodily training, or of the teaching of gymnastics in schools, should apply with double force to the female sex.

"The programme of a girl's life consumes the greater part of the day in sedentary occupations. Sewing, piano-practice, drawing-lessons, embroidery, are among the added burdens of the life of girls at home. If parents cannot be induced to take active steps for their children's physical training (and I fear they cannot), the school must undertake the task, on behalf, at least, of the girls.

"The existence of spinal deformity has not yet received due attention from our public. It is hard to get at the facts. There are very few collected observations of masses of children. Parents would dread the exposure of their children; but perhaps the popular mind would not object to a lady surgeon for girls. No figures are procurable from female colleges, though the very great prevalence of curvature is admitted. The late Dr. J. C. Warren in 1830 stated that of the well-educated females within his sphere, about one-half were affected with some degree of distortion of the spine. It is not a wild guess to suppose that this is nearly true at present.

"Spinal curvature is not only a product of low vitality, but it does harm by permanently fixing vitality at a low standard. The spirometric observations of Schildbach (Amsterdam, 1862) showed that the respiratory capacity of this class of children at the ages of from thirteen to seventeen was lessened by one-

third, and in some cases by one-half,—a matter of the gravest importance in the maintenance of life.

"Brown calls attention to the fact that too much mental stimulus has an undoubted effect as one of the predisposing causes of spinal curvature. Mental rest combined with other appropriate conditions will sometimes cure the trouble in its incipient stage.

"The disease may exist in a fully-developed form without any apparent change in the direction of the spine as seen from behind, even when the body is stripped: this is because the twisting may be confined to the bodies of the vertebræ, which are out of sight. The first thing usually noticed is that "the shoulder grows out," or else is higher than the other one. The ribs partake, and the chest is twisted out of shape.

"Patients may sometimes be kept in school who need special seats. This is a matter for the surgeon to decide.

"DESKS AND SEATS.

"The improvement which has been made in American school-desks and seats within half a century is very great. Few city schools are now unprovided with 'modern' furniture, which in most cases is decidedly better than the old. It is to be hoped that the excellence already attained will not stand in the way of further progress. We have been quite successful in reaching our ideal of *comfort;* but we ought not to forget that the subject has been much studied, from various other points of view, by German and other investigators, and with results which certainly differ from ours.

"Bad desks are chargeable with aiding the formation of two of the most important 'school-diseases,'—near-sight and spinal curvature. They cause the first by compelling pupils to hold the eyes too near the object, and by favoring a stooping position at work. Spinal curvature is very much assisted by the twisted postures which children take, especially in writing.

"Let it be understood that it is not our object to make desks

and seats which a scholar can occupy with comfort, assuming and maintaining one 'normal' position, for hours at a time; no, nor for one hour. It is not possible to do this; and, if it were, it must needs injure the child. The discipline of a school is a precious thing, but it should not interfere with the child's need for change of attitude; nor must the teacher fancy that in prescribing fixed attitudes he is following the dictates of 'medical science.' Attitudes assumed for a few moments, for purposes of respect and attention, may properly be formal; attitudes in study should be decent, but may be as varied as possible, subject to correction when they become injurious. The teacher should be a judge of the latter fact. Especially should liberty be given to the younger classes. There is indeed a great difference between the mobility of a kindergarten and the studious self-possession of a high-school class at the age of sixteen or eighteen.

"Strength cannot be gained by maintaining any one posture, unless in the sense that a comfortable posture gives strength by resting the muscles. If a comfortable position is given, let the child not be kept in it till rest itself is fatigue.

"As standing is undesirable exercise, so is sitting in a chair without a back. It will not make the child's back strong, but only causes fatigue, and drives the child to take all kinds of unsuitable positions for relief.

"The young pupil should have a seat and desk so well adapted to its form that it will be tempted to take the most correct position, as being the most comfortable. It will not keep this position long, however comfortable it may be, but it will return to it after making its little excursions and changes, and will by degrees become accustomed to a normal position without much being said about the matter.

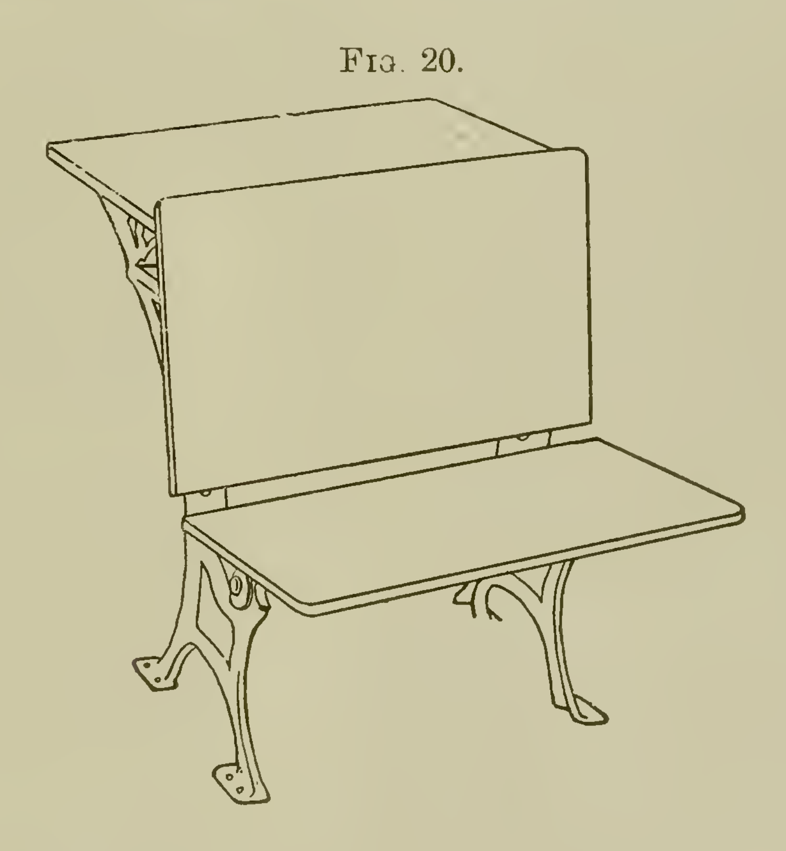
"Little children may properly be taught to sit still, facing squarely to the front, for five minutes at a time, when circumstances favor it. They may be taught, by degrees, to sit ten minutes, but not through a school-session; every *rest* must be made up by a corresponding *activity*,—a change or a move-

ment, a song or a bit of gymnastic drill. Movement is a child's way of resting: rest is a kind of work, to be taught by degrees.

"As regards faulty positions, *stooping* contracts the chest and compresses the abdominal organs. The child, sitting erect, and wishing to bow the head towards the book, may be shown that a very slight movement will accomplish that object,—a hinge-movement at the upper part of the neck, and not at the shoulders. The trunk does not need the support of the elbows on the desk. One-sided positions easily become habitual, and are then exceedingly objectionable: they are chiefly caused by propping the arm or elbow on the desk.

"A comfortable back for the chair is best secured, not by giving a series of marked curves intended to follow the natural

Fig. 20.



curves of the body, but by giving, first of all, an emphatic support to the lower part of the spine. The writer was recently shown a rather stiff-looking seat, of which the dealer remarked that all those who sat down in it at first said 'no,' but if he could induce them to remain sitting fifteen minutes

he was sure to sell it. The seat in question has a flat bottom, sloping a little down and back; the back is tilted, and is composed of two flat surfaces set together at an angle so small as hardly to be noticeable,—the projection being one-quarter of an inch from a straight line. (See Fig. 20.) This chair, supporting the pelvis solidly, gives great comfort. A somewhat greater projection of the lower middle part of the back might be useful.

"This principle, which the writer is convinced is of the greatest value, may be carried out in other ways. The matter

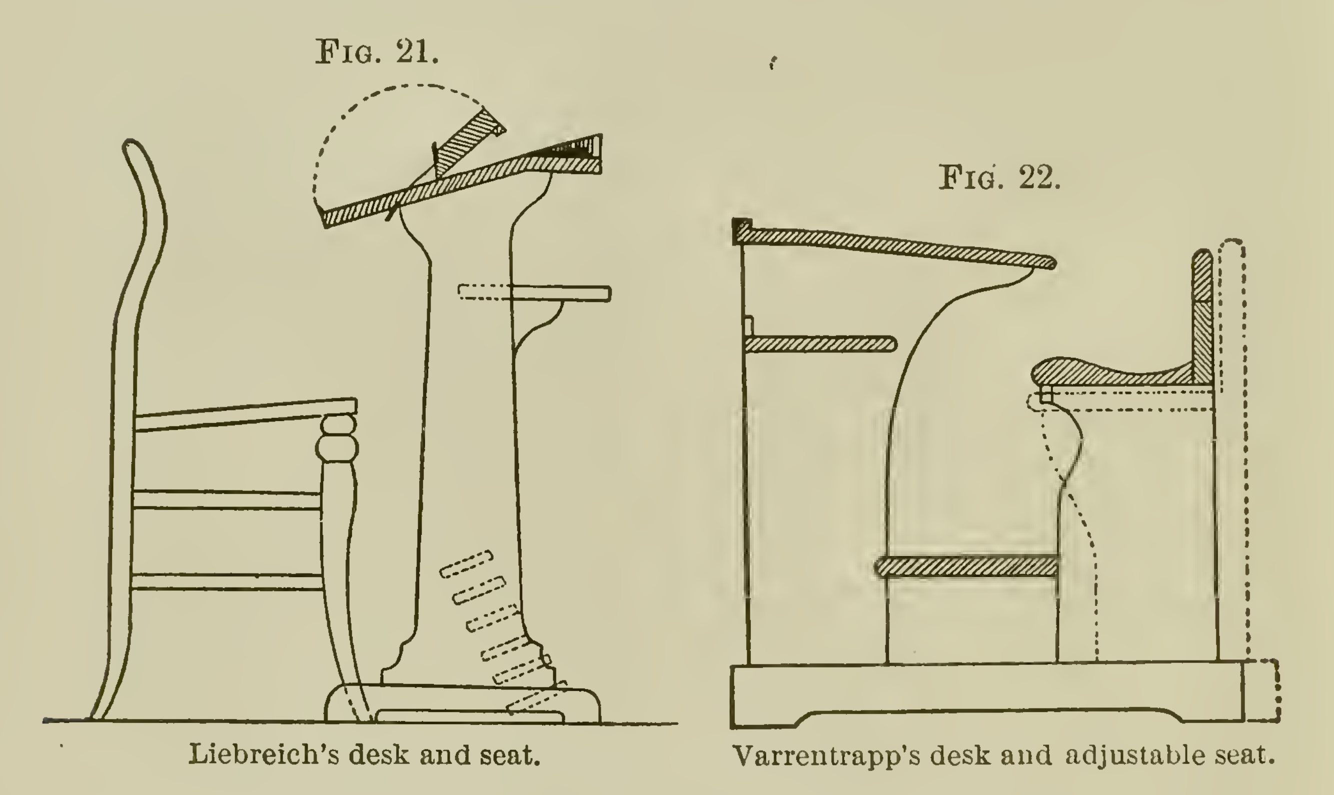
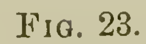
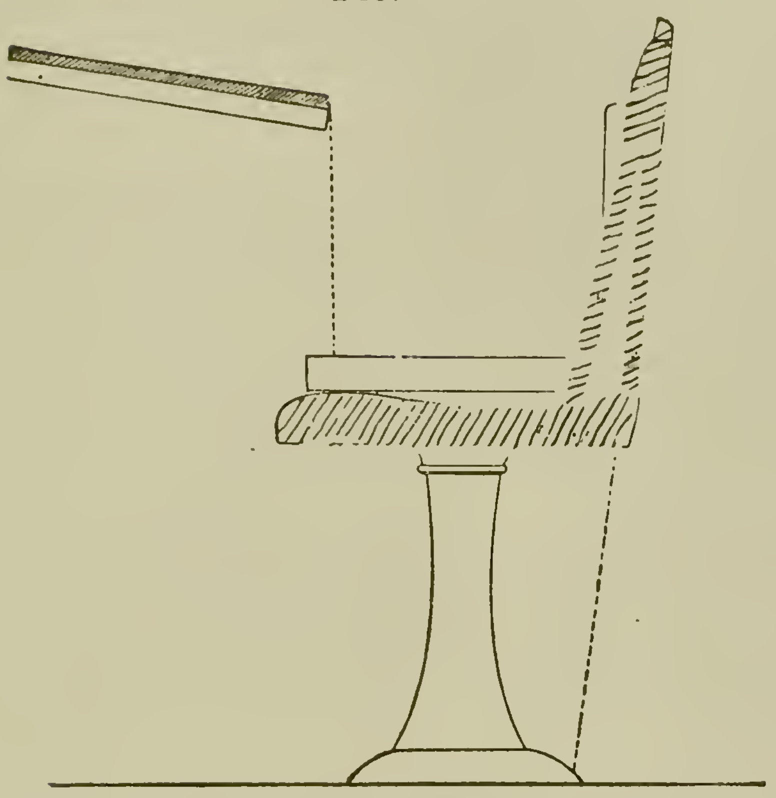

Fig. 21. Liebreich's desk and seat.

Fig. 22. Varrentrapp's desk and adjustable seat.

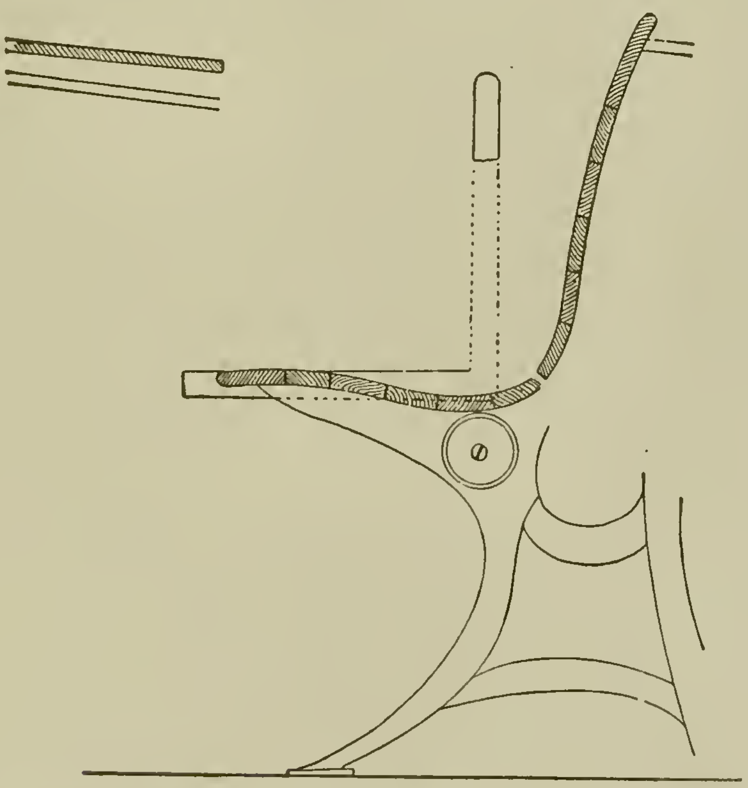
is not wholly settled, as may be seen by comparing Figs. 21, 22, and 23, given by different authorities. Liebreich's chair (Fig. 21) is intended to support the pelvis by following its outline by a curve up into the small of the back: the projection of the curve may be too great. Fig. 22 (Varrentrapp's), and the unshaded spaces in Figs. 23 and 24, give the impression of stiffness; they come to the height of the elbow, and give support solely by a horizontal cross-bar at the top, allowing a little open space below the bar. It is noticeable that many of the later German plans proposed by scientific men give support in


FIG. 23.



Varrentrapp's seat and desk compared with a Boston school-chair and desk (see Fig 25) for corresponding ages.

FIG. 24.



American curved-back seat and desk (shaded), and Buchner's pattern, for corresponding ages.

this way. Their object is to enable the child to sit erect while writing, with the aid of a partial support, not necessarily used at all moments: it is thought that such a support gives the habit of a correct attitude. Buchner was an inspector of schools: he says, 'The children very soon feel that the perpendicular piece supporting the small of the back corresponds with the structure of the body much better than the slanting back which supports the shoulders. I often used to ask the children whether they would not like to have a rest for the shoulders, as well as for the back, but the girls always answered in the negative.' Cohn and Fahrner are also in favor of the low support. It is of wood, two and a half to three inches broad, and long enough to be reached by both elbows, which may rest upon it when the child is not writing. It must not be placed too high, or it fails to give due support.

"It may be doubted whether a low back-rest of this kind or a slightly-inclined rest for leaning back, supporting shoulders as well as pelvis, is, on the whole, the better. The present writer is not in a position to decide; yet a choice must be made, since it seems impossible to secure a resting-chair which shall also give support in writing.

"The popular American school-seat, with its back curved like a long italic *ſ*, is not an ideal model. It is comfortable,—at least some are, for there are varieties. Some of them let the body slide down so that upright sitting is impossible; others are too low, which tends to increase the constriction of the abdomen; as a rule, they give the body a round-shouldered position, being essentially lounging-chairs with the head-rest cut off. Fig. 24 gives a good pattern.

"Our common wooden chair, with the back-sticks set in a curved line, quite fails to support the pelvis; in fact, its deficiency in this respect is a positive annoyance. Fig. 23 shows a chair with this fault. It is built thus to give strength; this is better secured in an old pattern which prolongs the middle piece down to the pedestal, following the dotted line, and so is able to bring the side-pieces in line with the middle piece.

"Fig. 21 gives Liebreich's desk and seat, as designed for the London School Board. The desk remains the same; the accommodation for different ages is made by changing the chair and moving the foot-rest. The shape of the seat is slightly different for the two sexes. The lid is hinged so that it can be thrown into a convenient book-holder for reading. In writing, the chair is placed so near that the edge of the desk just touches the body. The height of the seat is correct when the sloping line of the desk, prolonged, just touches the elbows.

"Fig. 22 gives the design for the desk and seat published by the late Dr. George Varrentrapp, of Frankfort-on-the-Main, in the *Vierteljahrsschrift für Gesundheitspflege* for 1869. It is the one from which the unshaded spaces in Fig. 23 are taken. The desk remains the same for different ages; the seats are of different sizes, the dotted outlines corresponding to larger pupils.

"Fig. 23 gives a side-view, drawn to scale, of a highly-approved American school-seat, of a size intended for pupils from ten to twelve years old. The position of the lid of the desk is also given. The unshaded spaces show the position of corresponding parts of the model designed by Varrentrapp, of dimensions suited for children of the average height of one hundred and forty-three centimetres, which for American children represents a little over twelve years. The lower edge of the desk, measured from the seat, is 4½ centimetres = 1.8 inches higher in the American than in the German seat. The German back-rest is on a level with the desk, and the pupil while reading can easily prop his elbows upon it, maintaining an erect posture.

"The dimensions, in centimetres, are as follows:

	Height of Seat.	Height of Desk.	Difference in Heights.	Height of Back-rest.	Desk to Back-rest.	Seat projects under Desk.
American . . .	36.9	64.8	27.9	(35)	30	5.2
Varrentrapp . .	40.2	63.6	23.4	23.4	26	2.6

"Fig. 24 gives the side-elevation of two full-sized desk-seats, drawn to scale. The American desk is the largest size of one of the most popular kinds. To correspond with this, Buchner's tables were taken, and the dimensions calculated for a person five feet six inches in height; the lines of desk and seat are given with shading for the latter case. The difference between the heights of the desks is nearly 4 centimetres = 1.6 inches. The difference is increased, practically, by the downward and backward curve of the American seat.

"The dimensions, in centimetres, are as follows:

	Height of Seat.	Height of Desk.	Difference in Heights.	Height of Back-rest.	Desk to Back-rest.	Seat projects under Desk.
American . . .	43	76	33	(44)	44	1 or 2
German	42.9	72.1	29.2	32.1	23.8½	5.2

"Fig. 25 is the American model from which the drawing Fig. 23 is taken. The fact that the desk-lid is considerably higher than the pupil's elbows is correctly shown. The occupant cannot be supported while sitting upright, and when sitting back his eyes will be too far from the book for ordinary work.

"Fig. 26 shows the Belgian model in the Philadelphia Exhibition of 1876. It carries out very well the idea of supporting the sacrum; there is a turn-back lid, and the under side of the hinged part has a cushion at *x* for the use of the girls in sewing; there is a peg for the hat at *o*. The seat, however, is much too far from the desk.

"Stooping, cramped, awkward positions are not very likely to be assumed in a desk and seat well adapted to the occupant, except in the acts of writing, ciphering, and drawing. Bad postures in these occupations are far worse than in others, from the seeming naturalness with which they are assumed, and the certainty with which they become habitual. If a

child can be taught from the beginning to write in a proper attitude, one of the commonest and worst of school-faults will

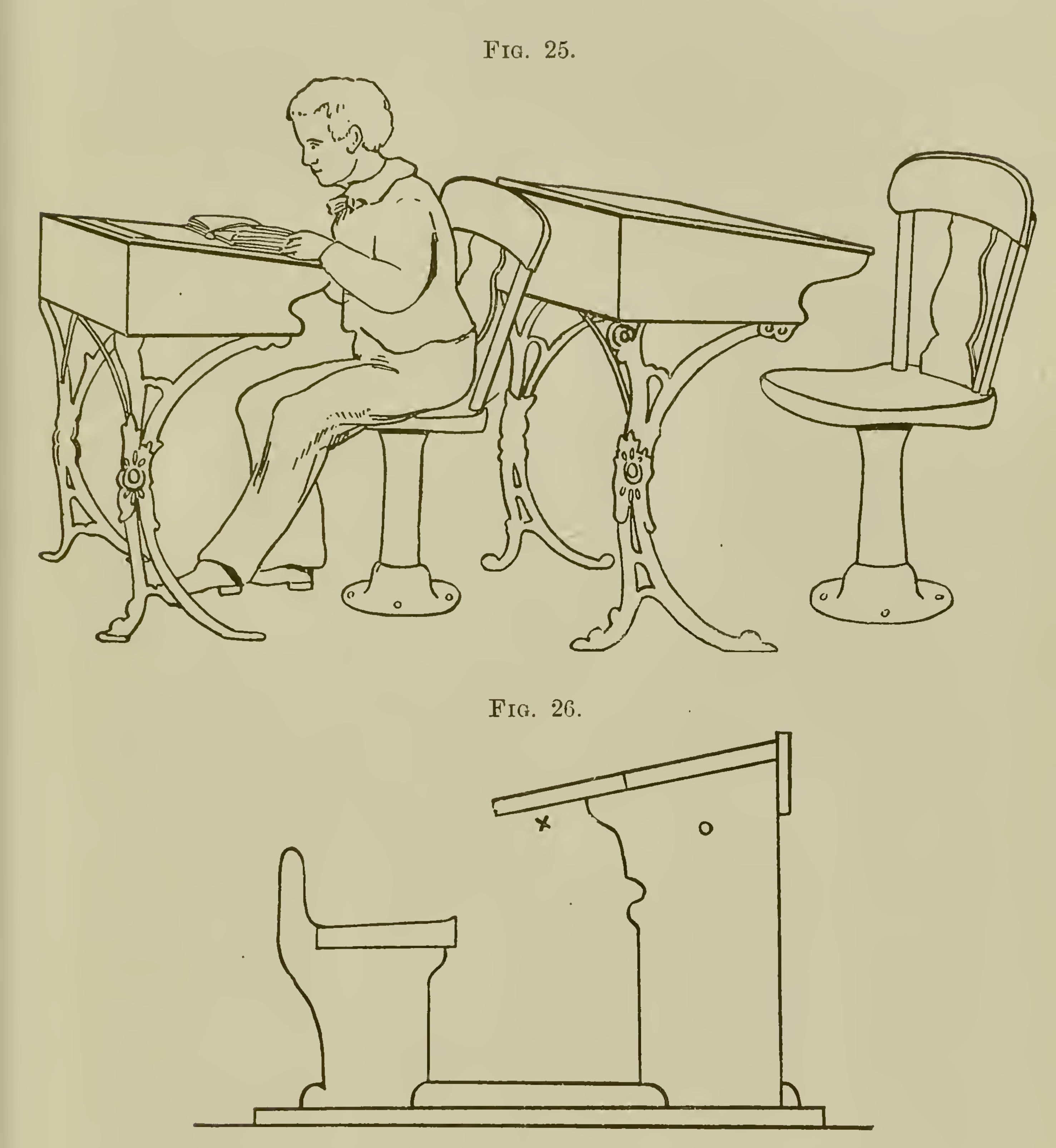


Fig. 25.

Fig. 26.

be broken up. If there is to be a reform in this matter, let it begin at the beginning; let the youngest classes be the first to

receive the ideal desk (whatever that be), and let the change go on, following their progress in the schools. Time ought to be devoted to acquiring the habit of sitting well, especially at the beginning of school-life.

"The correct posture in writing is one which does not twist the body or neck. The pupil faces the desk squarely; the shoulders are equally distant from the lid of the desk; the trunk is erect and nearly touches the desk. The lid must be high enough just to support the forearms, but not so high as to raise them; they rest lightly on the lid, but do not sustain the weight of the body. This posture cannot at first be maintained long. Perhaps five minutes at a time is all that we can expect of beginners; at all events, nothing is more certain than that children begin to lapse from this uprightness by that time. What can be done then? The effort to force fifty children to keep in one position cannot succeed beyond a brief time, and the bad position must not be permitted: hence, as soon as fatigue begins, it is best to give a total rest by letting the children sit back, stand, etc., and then resume writing.

Fig. 27.

"The 'systems' of penmanship in vogue do not satisfy the demand here made; they do tend to twist the spine. In some cases the pupil is directed to turn squarely to the left, letting the whole right forearm swing over the desk-lid, on the elbow as a pivot. This raises the right shoulder. In others the direction is to turn partly to the left, or partly to the right. The positions assumed in these cases are almost invariably faulty: one or the other shoulder is raised; the head leans to the right or left, and sinks by degrees until the ear may come in contact

with the hand and the nose almost grazes the paper, the spine meantime assuming various curves.

"Fig. 27 illustrates the position of the manuscript on the desk. It is copied (with a little simplification) from an article by Staffel in the *Centralblatt für allgemeine Gesundheitspflege*, 1884, p. 45. If the pupil sits in the correct position, facing squarely to the edge of the desk *ab*, and looking in the direction *hg*, *df* represents the axis of the right arm, *f* being the point of the pen and *e* the place where the wrist touches the paper. The left hand steadies and adjusts the paper, and must be near the right hand, so that the two forearms point inward and nearly meet at the hands. To correspond with this, the paper is tilted thirty degrees from the perpendicular, towards the left, which enables the hand more easily to follow the direction of the ruled lines on the paper. This tilting of the paper is a natural device,—the reader has probably often practised it without special thought; it is, however, mechanically and physiologically the correct plan for easy writing.

"The letters acquire a slant of thirty degrees when the paper is held in this position. This is owing to the fact that the most natural and easy way of making down-strokes is to make them parallel to the line *gh*,—or perpendicular, as the paper is commonly held. Children and blind learners begin with these strokes.

"Some additional points require mention :

"1. The chair is often too high for young scholars. The most convenient plan may be to provide footstools.

"2. The seat, from back to front, ought to be long enough to support nearly the whole thigh. A more or less spoon shaped hollow in the seat is commonly thought desirable. The curve of many settees is such as to produce pain at the point where the bones (tuberosities of the ischium) rest on the wood: the support is not wide enough.

"3. Seats must have backs. The straight upright back reaching to the shoulders is bad; a straight back slightly tilted is not bad. American seats are commonly curved, with curved backs, as in Figs. 24 and 25.

"4. The edge of the desks should come up to, or overlap, the edge of the seat. The recognition of this fact is a recent discovery: desks used formerly to be separated from seats by a space sufficient to enable the occupant to rise in his place, but sinee desks are now made separate or in pairs, it is only necessary to step into the aisle.

"5. Most of our best desks are too high, relatively to the seat. The reason for making them high is, doubtless, to prevent the pupil from stooping. Something is eertainly gained in reading, by this plan,—at least, in eonvenienee of reading,—but it interferes with correct positions in writing. The elbows, hanging freely, should be only just below the level of the lid.

"For near-sighted children, the higher desk may be a neeessity in writing. If the desk is made as low as is here reeommended, a portable arrangement resembling a writing-desk may be plaeed on the desk.

"DISEASES OF THE EYES.

"*Near-sightedness*, with some other diffieulties, composes one of the most important divisions of our subjeet. To some extent the production of myopia is doubtless due to eonstitutional weakness or to depressing causes aeting temporarily. Landolt eonsidered hardships and poor fare the leading causes, but his opinion seems an exaggerated one. Loring has argued forcibly in favor of more active sport for growing youth, and has shown how eonfinement to the house, short hours of relaxation, and undesirable fare, must be considered important causes of the exeessive prevalenee of near-sight on the European continent.

"Other faets whieh may illustrate this point are the exeess of near-sight in eities; the general prevalence of poor health among the same classes of students that are subjeet to near-sight; the readiness with which the eye may be injured by work performed before breakfast, during fatigue, or after recovery from acute fevers. An associated fact is the low

vitality prevalent among blind people,—which may, however, be an effect rather than a cause.

"As regards map-drawing, the best plan is to use large paper, make strong outlines, and insert few details, the object being by no means the production of handsome work, but the fixing of leading facts on the pupil's mind. In penmanship and sewing, and still more in embroidery, harm may easily be done.

"Interesting remarks upon the most desirable form of type for clearness are made in Dr. Jeffries's article, Massachusetts Board of Health Report, 1882–83: they are from Javal. Many school-books are excellent in this respect; many are still bad.

"The pupils' most common neglect (says Soldan) is in regard to their eyesight. They injure the eye by reading by a lamp close to the head, without a shade: the object of the latter is quite as much to keep off heat as light. They work in the evening instead of by day. They read novels six hours and then study two. They defer the most taxing work (such as drawing) to the last minute.

"*Light.*—Defective lighting is one of the chief faults of school-buildings. The difficulty of satisfying the requirements in cities is stated under the head of 'Site for Schools.' For a northern climate, a very free exposure to sunlight is desirable. Large trees often need removal. If possible, direct sunlight should enter every room at some hour of the day.

"A sufficient light implies light which easily reaches the back of the room. Lighting from one side, as practised by the Germans, is thought by most of our architects insufficient. In fact, a room with sixty scholars and an allowance of two hundred and fifty cubic feet of space per head will necessarily be too deep for good unilateral lighting. The simplest remedy is to make windows on one side and at the back. This principle, carried out, gives us the square school-house with four corner rooms on a floor, or, as in the Cleveland model, with six rooms on a floor. It has the advantage of natural draughts. If the combined size of all the sashes equals one fifth or one-

sixth the area of the floor, it is usually said that the supply of windows is sufficient. Small windows are not the fault of modern school-houses.

"To get the best effect, windows must reach within a few inches of the ceiling. They ought to have square tops, not the Gothic shape adopted in the St. Louis model; they must have no heavy projecting outside ornaments to cut off light. Instead of Italian awnings for summer, they should be guarded with blinds on the inside. It is hard to find screens that will at once exclude the sun's rays and admit enough light and wind. Neither white nor yellow nor red screens are pleasant when the sun is on them: a neutral gray is best. A neutral light tint is suitable for the walls.

"Lighting from both sides is well enough for small school-houses of one room. There is, however, a preference for light coming from the scholar's left hand, especially in writing. Rear windows may be added if thought necessary; they give a general increase of light: their worst point is that they try the eyes of teachers, but that can be relieved in two ways,—either by a rather dark shade rolling up from the bottom, or by placing the windows about six feet above the floor, so that the direct rays do not strike the teacher's eye when looking at the class. It is a cardinal rule that no one shall be forced to face the windows while reading or otherwise exercising his sight: therefore no windows must be in front of the scholars. Black-boards are generally put wherever there is room; those between windows ought to be little used; their surface must be a dead black, not glossy.

"This, however, gives but one aspect of a wide question. Other important causes—perhaps much more important—are the following.

"Excessive use, even under favorable conditions, wearies the eye. It seems well proved that, in general, students who spend longer hours over home lessons are affected by near-sight in larger proportion. The practice of working without rest for long periods is worse than working many hours with pauses.

"Poor light has always been considered one of the leading causes. It not only fatigues the eye, but also induces the pupil to bring the eye close to the book.

"Constant attention to near objects doubtless has its effect, even when they are 'near' only in the sense of being bounded by the walls of streets. City children live in a narrow horizon. The youthful eye has a marvellous power of seeing things at the distance of two or three inches; and many things in school-life conspire to bring about habits based on this power of adaptation,—badly-proportioned desks, poor type and ink and paper, poor light, excess of light. The eye that is laboring at too short a distance is enabled to do so by the action of the 'muscle of accommodation' in the eyeball, which arranges the focus by changing the shape of that organ. Such an eye is working in a state of tension, which tends, if long continued, to produce a permanent change in the form of the globe, making it longer from back to front, which constitutes the chief characteristic peculiarity of the near-sighted eye. Very few, if any, children will obey physiological laws of distance without being compelled to do so. There are certain faults in school furniture that favor the bad habit: too great height of desk relatively to seat; separation of desk from seat by an interval, instead of having the desk partly over the seat. These, and bad positions in writing, have been mentioned already.

"Anything tending to cause congestion of the eye aids in forming near-sight. Among these causes are tight clothing (corsets, neckties, collars, belts); indigestion, particularly constipation; overheated rooms, with bad ventilation; overwork of the brain, especially if it causes headache. Fulness of the blood-vessels stretches the eyeball and assists the tendency to a change of shape as above noticed.

"All these influences have their effect chiefly during childhood: few persons become near-sighted after they are grown up, though an increase of near-sight is not rare. This circumstance is one of many which warn us that bodily development is liable to be impeded or distorted in every direction by false

education. Every plan which aids in strengthening the constitution of children may be considered as a contribution to the health of their eyes. During childhood the tissues are less firm, more elastic, than later in life; they are more quickly renewed, more easily distorted. The geometrical deformity of the eyeball is produced by pressure at this tender age. The remedy seems to require not only that we lessen the daily amount of pressure, but also that we encourage those active habits which will make the fibre stronger and more resisting.

"Hereditary influence is undeniably powerful. What may be the effect of several generations of accumulated tendency in studious families cannot be predicted: a learned friend of the writer's suggests that the result may not be blindness, but a permanent type of myopism, in which children will be born short-sighted and will not need to become so. But in speculating about the future it is necessary to take account of other tendencies. Far-sight is quite common among children; and the action of inheritance seems not to be limited to the repetition of identical defects, but to reproduce both anomalies—the long eye and the short eye—with a certain degree of indifference. The existence of a tendency to the normal eye is probable, independently of the elimination of unfit persons from the race.

"Blindness, or an approach to it, is the tendency of a certain number of cases of near-sight; the retina becomes gradually detached from the back of the eye, and becomes incapable of receiving exact impressions. On this account (as well as for reasons above given) the 'near-sighted eye is a diseased eye.'

"Test-types, or large cards on which lines of letters of graded sizes are distinctly printed, are a ready means of estimating the degree of near-sight in the hands of school-principals. To give such observations full value, atropine and the ophthalmoscope, in expert hands, are required. A much-used eye is apt to be in a state of tension which makes it temporarily more near-sighted than it really is; atropine relaxes the tension.

"There exists a prejudice against the use of glasses, which is

natural enough. But if near-sight is considerable, so that a child really cannot work well in an erect position, it is necessary to allow a pair of very weak glasses. The matter cannot be determined by directions given in an article like the present: the decision and choice must be left to the physician. A limit or minimum distance at which the book may be held from the eye should be stated, and children advised and corrected of their bad practices. The least distance, recommended by the Commission d'Hygiène des Écoles of Paris in 1884, was twenty-five centimetres for children in the lowest schools and thirty-three for those from eight to twelve years old,—about ten and thirteen inches respectively. Fifteen inches is proper for those of larger stature, but would be impossible for little children.

"*Hypermetropia*, or long-sight, is not uncommon among school-children. Its effect, when it is of a high degree, is to make the act of reading difficult or painful, and sometimes to put an end to a child's career in school. Those subject to it read fairly well for a time, but after a while become conscious of effort in the act of seeing. The eyes feel strained, and the letters become somewhat blurred. There is a desire to rest the eyes, or to close them firmly, or to compress them with the hand. A fresh start is made, and a second rest has to be taken after a shorter period. Sometimes the habit of holding the book close to the eye is acquired, which makes the case seem to be precisely the opposite of long-sight. The choice of glasses (convex, or old-sighted) should be directed by a competent physician, for the purpose of enabling such children to work without suffering. One effect of the disease is the production of internal squint.

"*Astigmatism* is rather common, and gives as much annoyance as near-sight. It depends on an incorrect curvature of the front of the eyeball (cornea). It is known by producing a blurred look in lines that run in one given direction: some people see horizontal lines badly, some perpendicular ones; in others there is an oblique axis of indistinctness. If at all troublesome, this defect ought to be remedied by glasses,—

as it can be perfectly. It is not a disease in the sense that near-sight is.

"PHYSICAL TRAINING.

"The connection between physical training and general education is obvious. The principle being granted, it remains for us to consider how much the school and the college of to-day should be required to give of their energies to the furthering of this end.

"A system of calisthenics is at present widely used in public schools, with distinct benefit. It is not probable that the system will ever be abandoned. Most readers must have seen the pleasant sight of a roomful of children engaged in the simple but vigorous movements of the arms which serve so well as vents for superfluous energy. These trained movements are an indispensable part of primary-school work, and are of great use in the intermediate grades, but are of subordinate value (as now practised) for older pupils. They are quite difficult enough for little children, but above the age of twelve scholars begin to look down on them as childish, and with good reason, for they lack one essential element,—they do not call forth exertion to overcome resistance. For better work, scholars should have light dumb-bells and wands, and more space to use them than can be found in an occupied room.

"The immediate benefit of exercise, however, does not depend on any large amount of development that it imparts. Very simple exercises, without any apparatus, practised twice a day or oftener for five minutes at a time, do a great deal of good. Far from breaking up the discipline of the school, they make it easier, by relaxing the tension of mind and by introducing the element of pleasure. The eyes are relieved at the same time. A piano adds pleasure, but is not essential. The windows should be opened at the instant the signal is given, by having one boy assigned to each.

"The facility with which calisthenics are practised should not blind us to the imperfections of the system. The movements employed are limited to such as can be safely made in

a room full of desks: the pupils ought to have a much wider range of action, in an open hall, large enough for fifty or sixty to exercise in.

"A good type of light gymnastics adapted to use by classes is furnished by Amherst College. In that system every student is required to attend unless physically unfitted. The work is done in classes, to the sound of the piano, under a leader; students attend four days in the week, half an hour at a time. Most of the work is done with wooden dumb-bells; there is also considerable running, and some marching. The exercises are eminently cheerful; compulsory attendance meets with the acquiescence and support of almost all the students. In fact, the exercise is a union of recreation and amusement with work.

"This moderate amount of exercise is sufficient for nine-tenths of the men. For those of unusually muscular frame, heavy gymnastic apparatus is provided; for a few, special developing apparatus is needed; all are sufficiently under control and observation. No serious accident has occurred since the opening of the gymnasium in 1859.

"The direction is in the hands of Prof. Edward Hitchcock, M.D.; the duties of his position include teaching gymnastics, physiology, and elocution as connected with bodily movement; he is expected to be acquainted with the health of each student, and is required to furnish the excuse whenever sickness compels a student's absence. The department is dignified by marks given for attendance and deportment, and its head is a member of the faculty.

"The object aimed at has always been the promotion of health and power of work, rather than the development of muscle or the performance of feats of agility and strength. As evidence of the success which is attained, Prof. Hitchcock states that sickness among the classes diminishes regularly from the Freshman year up, being in the Senior year little more than half as great as in the Freshman.

"A system of this sort reaches a large number of young men who much need it. Few are so judicious and persevering

as to lay down a plan of gymnastics and adhere to it. Much of the apparatus in ordinary gymnasiums is unsuited for the beginner: its effect is to exhaust and rack his frame and discourage his efforts. The most complete outfit of apparatus, and the best instruction, will not insure the attendance of the very class of men who need the training most. Nothing is, on the whole, so well suited to the average needs as a class-system resembling that of Amherst.

"At Harvard there is everything except compulsory class-work. Careful measurements of the person enable the superintendent, Prof. Sargent, to assign special exercise to each young man, defined in kind and amount, for the purpose of strengthening his weak points. His apparatus and methods have been adopted by a considerable number of colleges, including some for women.

"A new feature of Dr. Sargent's work consists in taking of photographs of gymnasts at the beginning of their course, to be compared with those hereafter to be taken on leaving college. It has been the writer's privilege to look through this list, now numbering several hundred; and it must be confessed that the most striking thing about them is the rarity of a handsome body, or of even a well balanced and proportioned body. Deflection of the spine is quite common. Athletic oarsmen show, by the twist in their upper backs, which side of the boat they are accustomed to row in; but most of the curvatures do not seem to arise from excess of muscle. A prevalent droop of the right shoulder is noticeable. It is thought that this may originate in carrying weights in the right hand, and perhaps in the musket drill of the public schools.

"Another noticeable thing is the frequency of the hollow back,—a peculiarity of form which may be hereditary, but may originate in weakness of the supporting muscles of the spine. Weakness of the upper part of the trunk, allowing the shoulders to fall forward and the neck to stoop, may be the first step, and the saddle-back may be merely the compensatory curve.

"Smallness of the chest, and consequent want of lung-power, constitute a failing that it is really of great importance to correct. There can be no safe athletic training for men whose chests are small: they run the risk of inflicting permanent injury upon heart or lungs by the efforts made with their large muscles. It is well known that a small chest predisposes to consumption. Our boys need not be athletes,—it would be better for the mass not to attempt to compete in that line,—but they ought to have better breathing-capacity than they now have. *Play* is better than any gymnastics, from a certain point of view; but a full allowance of the prevalent sports does not give to boys a good chest-development.

"The late Archibald Maclaren, describing the English schoolboy as coming under his observation, said, 'I find that almost every youth at the time of passing from the schools to the University has, as it were, a considerable amount of attainable power and material capacity undeveloped; his body, or rather a portion of it, is in arrears in this respect, and as arrears, and as a recoverable debt, the youth may fairly view it.' During the youth's first term of two months, with properly-administered exercise, the chest will expand, in all ordinary circumstances, two inches, and in peculiar circumstances he has known the increase to reach double that amount.

"Most sports develop the *legs* satisfactorily,—walking, running, leaping, foot-ball, cricket, fencing, tennis, racket, fives,—but some of these give in addition an excess of work to the right arm. The result of sports without gymnastic training is a frequency of pigeon-breast, hollow breast, drooping shoulders, and stooping. There is also an occasional excessive upward growth without corresponding expansion of the chest. These are the results of abundant play in English schools for the better classes, where play is a regular part of the day's business; they represent the best that a boy's play can do for his development.

"Military drill was brought into favor by the war; its supposed end is to furnish large numbers of men ready trained to

service in case of emergency. Some military men find that the real result is a conceit of knowledge and indisposition to enter the militia. Its best side is the moral side: it raises self-respect, and promotes obedience by showing the practical need of it. It is, further, as good exercise as many games are, and shares with sport the element of interest and pleasure. Schools known to the writer have given two hours out of the weekly programme to drill, and have found that the week's work as a total was not lessened. The objections are that the exercise is taken in a cramped position, every movement being executed to pattern, and that the number of movements is extremely few, so that the exercise is not at all a typical one for developing the body; also, that the musket is too heavy, and that it is carried chiefly in the right hand for convenience. The so-called setting-up drill consists of light gymnastics, the object of which is to give the soldier a good position at the outset: this is not and cannot be properly carried out in schools unless time is taken,—and the time is already taken for musket drill.

"The amount of time taken by Maclaren to correct the shape and growth of boys in his own school was one hour of gymnastics weekly,—this, in addition to abundant *play*.

"The children in the turner classes practise an hour twice a week, somewhat after the general plan of Amherst, aiming to give the girls more of grace (*e.g.*, by a variety of dancing movements) and the boys more of muscularity. Their work is well worth inspecting.

"The British soldier, on entering the army, is put through daily gymnastics from one to one and a half hours daily for three or six months. It is unnecessary to describe the practice in other armies.

"In our public schools the friends of reform should not be satisfied with less than half an hour twice a week, under trained teachers. An hour twice a week might afterwards be thought desirable,—the method to be that of light gymnastics, to some extent imitating that of Amherst. The teachers may

be specialists at a moderate salary; or the work may be done by such of the regular teachers as have special gifts for it, as is the case in Germany. As regards the amount of work to be done, or the teaching force, the city of Frankfort-on-the-Main is a good illustration: there are twelve thousand children in the public schools of that place, and the number of hours given to gymnastics is equivalent to the constant services of seventeen and a half teachers. The city has special halls with apparatus, of the length of from twenty to twenty-five metres, nine or ten metres wide, and from five to five and six-tenths metres high.

"*The Routine of a School-Day.*—It will not be without profit to study the arrangement of time and occupation made for cases where a young person's whole time is under control. In making the plan it is necessary to have a clear idea of the amount of work that is desirable. Time must be assigned for play, and for gymnastic lessons: either or both may be made compulsory (as foot-ball is in some of the great English schools).

"The following is an outline of a day's work in one of the best American boarding-schools for preparation for college:

SUMMER.	WINTER.	
6.30	7	Rise.
7	7.30	Breakfast.
7.45	8.15	Prayers.
8	8.30	Study and recitations four and three-fourths or four and one-half hours.
12.45	1	Intermission.
1	1.15	Dinner.
2	. . .	Study-session in summer one-half hour (none in winter), then play-time.
2.30	2.15	Play-time, summer three and one-half, winter two and three-fourths hours.
. . .	5	Quiet in session, study optional.
6	6	Supper, one-half hour.
6.30	6.30	Intermission.
6.45	6.45	Prayers.
7	7	Study-session in school-room until bedtime.
8.30	8.30	Youngest boys (twelve and thirteen) go to bed.
9.15	9.15	Middle boys (fourteen and fifteen) go to bed.
10	10	Older boys go to bed.

"The amount of sleep allowed for is from eight and a half to ten and a half hours, according to age and season. The boys all have the gift of sleep, and use all the time allowed. Study and recitations for the youngest boys, six and a half or six and three-fourths hours; for the oldest, about eight hours. Play, two and three-fourths or three and one-half hours, according to season, in a solid lump, besides some intermissions too short for serious play. There is a twenty-acre lot to play in; in winter they use the gymnasium at their option, under control of a tutor. Detention for punishment is assigned to the afternoon play-hour: most boys average one hour a week at most; mischievous boys suffer longer detention, but in no case to their physical harm. Sweetmeats are not expected to be sent from home; if discovered, they are confiscated, or are served at the boys' table so that many share.

"Compare with this the routine of a large boarding-school for girls, of very good standing, in the same part of the country:

6.30	Rise.
7.10	Breakfast.
8	Recitation, forty-five minutes.
8.45	Prayers.
9	Recitations and study, four hours.
1	Dinner.
2.15	Walk, in which all join.
3	Study and recitation, two and one-fourth hours.
5.15	Recreation,—free time.
6	Supper, followed by recreation.
7	Prayers.
7.15	Study, one and three-fourths hours.
9	Bedtime.
9.30	Lights out.

"Here are nine hours assigned for sleep, and eight and three-fourths hours for study; but three-fourths of an hour is taken out every day for gymnastic exercise in classes. All take a walk of three-fourths of an hour. There is apparently a considerable amount of time left free. The contrast between girls and boys is seen in the compulsion exercised in regard to all exercise, which is doubtless necessary. The required hours of work are likely to be too long for some girls; and if music

and letter-writing and literary societies and prayer-meetings are added, girls are likely to be burdened. Visits to the pupils' homes in term-time are properly forbidden.

"Detention is an effective means of punishment when not carried too far; but when a boy's Saturday forenoon, or even his whole day, is spent in silent confinement for a series of small faults, the effect is bad, morally and physically. An occasional good whipping is far better.

"The chief objection to corporal punishment is perhaps its effect on teachers. Without exactly making them cruel, it presents a temptation to hasty and often excessive action, afterwards regretted. Girls should not be punished in that way; boys seldom, and with conscientious reflection, without anger.

"The city of Cleveland requires that every case of corporal punishment shall be reported to the superintendent of schools, in blanks containing the following headings: date; offence; general character; home influences; means employed for reform; whether parents were previously notified of misconduct, and what answer was given; whether ever previously referred to the principal of the school or the superintendent, and how often; result of punishment.[1] This represents fully the present tendency to caution. . . .

"VENTILATION AND HEATING OF SCHOOL-ROOMS.

"This subject is admittedly of the first importance. The school is the place for work, and bad air at once impairs the working-power. More than this, the effect of bad air is to deteriorate the whole constitution: there is little exaggeration in the statement that all diseases are either caused or are made more severe by bad air. Several notorious 'school-diseases' are rather closely connected with this cause,—dyspepsia, headache, nervous debility, anæmia, scrofula, consumption, various

[1] Report of Schools, 1875–76.

affections of the eyes,—the special discussion of which is found elsewhere.

"The impurities of air may be divided into three classes: 1, dust, smoke, stenches, gases from heaters, and other defilements which are independent of the presence of scholars, and should be entirely got rid of; 2, carbonic acid from the lungs; and, 3, organic matter exhaled from the lungs and skin. The last two are unavoidable, and must be allowed for in ventilating.

"Carbonic acid gas, in the quantity found in ordinary badly-ventilated rooms, is not probably of itself a serious source of injury. Men who go incautiously to the bottom of wells or vats sometimes become unconscious, and perish unless rescued, owing to the presence of nearly pure carbonic acid; but in rooms the amount present seldom exceeds five or six parts in one thousand, which quantity cannot be very actively injurious except in so far as it slightly lessens the proportion of oxygen. The lethargy of a close lecture-room seems to resemble the stupor of asphyxia, but in reality it is genuine sleep, caused by heat, bodily fatigue, an easy seat, a monotonous voice, weariness from continued passive listening,—all greatly aggravated by the bad air, no doubt. But carbonic acid by itself does not produce the violent symptoms of poisoning which are familiar from the description of the 'Black Hole.' Expired air freed of carbonic acid does produce such symptoms. The eminently noxious agent, then, appears to be, not carbonic acid, but the animal exhalations which accompany it in the breath.

"The process of analyzing air for the organic impurities is difficult and uncertain. It is therefore necessary to depend upon the comparatively easy and certain test for carbonic acid, which corresponds quite nearly in proportion with the organic impurities and is safely taken as their index.

"The atmosphere, when pure, contains normally about four parts of carbonic acid in ten thousand. Recent analyses seem to indicate that three and a half parts is nearer the truth;

but it varies somewhat, being larger in cities. Assuming four as the rule, the question arises, 'Supposing the air of a room to be constantly polluted by breathing, at what stage shall we say that it becomes unsuitable for further use?' The question is answered variously. Pettenkofer proposed seven as a standard of maximum amount of carbonic acid; Degen, six and six-tenths; while Parke, who may be regarded as the best authority in our language, sets it at six. That is, the permissible added impurities correspond to the addition of three, two and six-tenths, or two parts of carbonic acid in ten thousand. Parke bases his standard upon the personal experience that air at six seems pure, so that a person coming from the outer air perceives no trace of odor, or difference between the outer air and the room in point of freshness, while if the carbonic acid exceeds six the air usually begins to be perceptibly impure. When it reaches nine or ten the air is what is called close and fusty; above this it becomes disagreeable. After a person has been a few minutes in a room the odor becomes imperceptible, and he no longer can judge 'by the nose.'

"It is abundantly proved that in our climate, and for large bodies of persons, ordinary (so-called 'natural') means of ventilation by windows, fireplaces, and holes in walls are entirely inadequate, and must give place to the systematic use of flues of sizes suited to the supply required.

"*The allowance of fresh air per head* is based on the datum just given for *permissible degree of added* impurity. It is, unfortunately, the case that the impurity cannot be got rid of by itself; it mixes so rapidly with the air that it seems best, on the whole, to consider that the mixture takes place at once, and that our only remedy is to *dilute* the air by letting out some that is foul and letting in some that is pure. . . .

"It may be questioned whether children require the full supply of air assigned to adults. They are smaller; the work of transformation of material, though active, is in some degree proportioned to their consumption of food, which equals that

of adults at fourteen, but is much below it at six and eight; they are very active, yet doubtless do not perform as much absolute muscular work as adults. Figures quoted in the Lomb Prize Essays (page 73) show that children under ten expire about one-half as much carbonic acid as adults. . . .

"*Methods of Ventilation.*—The heated flue is at present the arrangement applicable to the greatest number of cases of school-house ventilation. Its size must be determined in accordance with the number of pupils in the room or house. In most cases one general discharge-flue is sufficient. It should be located centrally, so as to lose no heat to the outer air. It consists of a straight brick shaft, rising from the cellar to the roof, and capped above the roof to protect it from downward gusts of wind. To increase the current, the air is warmed by having the smoke-flue of the heater pass up through the middle. The velocity of the ascending air depends on many circumstances: if the weather outside is cold, if the chimney is high, if the heat is concentrated, the current is swifter than under the opposite conditions. . . .

"If a pupil requires one-half of a cubic foot per second, every square foot in the section of the chimney corresponds to ten pupils. A school of four hundred pupils requires a shaft eight by ten feet, inside measurement, not allowing for the smoke-flue and for space taken up by entering pipes and guards."

After dwelling at length upon the various methods adaptable to the proper ventilation of school-rooms, Dr. Lincoln says,—

"The preceding is an instance of thorough work. The next best thing, for those of limited means, is to avoid blunders and waste. The following points are offered with this purpose.

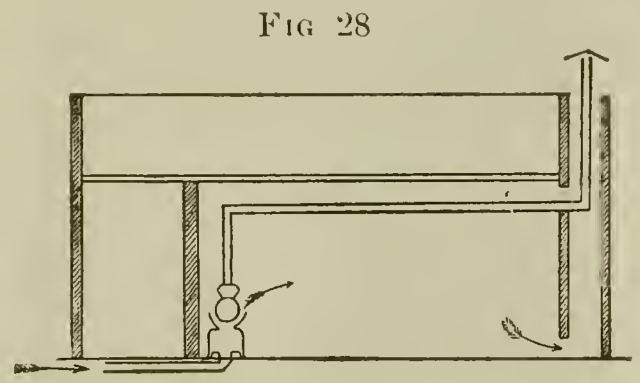
"Fireplaces are partial remedies for bad ventilation. They are now occasionally placed in new school-houses, both for this reason, and also in the expectation that they will be used for fires in mild weather; but the trouble of attending to such fires is too great for an average janitor. Their ventilating power is small compared with the demand, and may be roughly

stated as sufficient for ten persons while the fire is going. As a heater the fireplace wastes from seventy-five to ninety per cent. of the heat.

"Stoves arranged like the 'portable furnaces' that are set up in cellars are useful. The plan is to place a screen of zinc or galvanized iron around the stove, leaving an interval of a few inches for an air-space; a hole in the floor communicating with a pipe led out of doors, supplies a current of fresh air underneath the stove, which becomes warmed and rises into the room. The screen comes down to the floor; a valve regulates the supply of cold air.

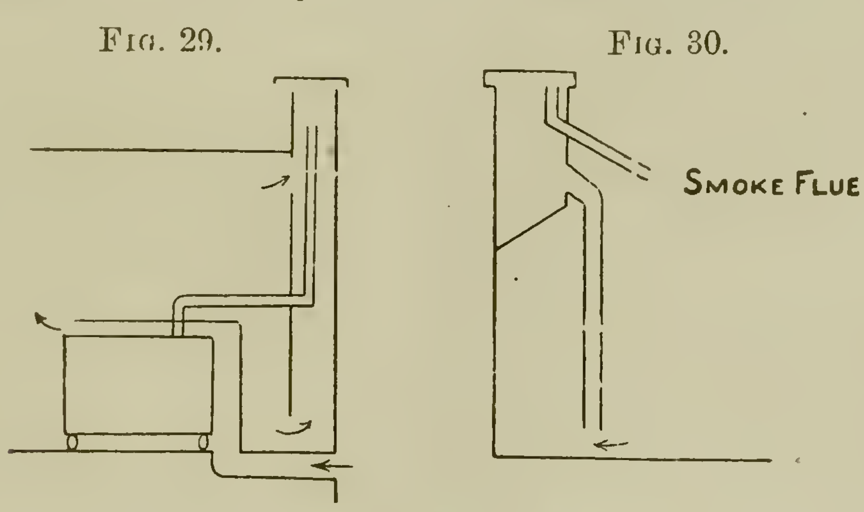
"Such a stove is shown in Fig. 28, an old design applicable to the case of a country school-house. The stove is set at a distance from the chimney, to get more heat from the pipe; the latter ought to have a strip of bright tin hung below it, to shield the heads of the scholars. The upper ventilator cools the room.

Fig 28



"Ventilating-stoves of various patterns are sold, based on the above principle. They cannot supply a quantity of air commensurate with the wants

Fig. 29. Fig. 30.



of a school, but they are good as far as they go, and doubtless economize fuel.

"Figs. 29–31 show how the principle of ventilating rooms by heated flues may be carried out. They are adapted from Mr. Jacokes's illustrations in the Seventh Report, Michigan Board of Health.

"Fig. 29 shows air entering by a pipe beneath the floor to the casing around the stove, which is four inches and six inches wide all around. Foul air escapes by the heated chimney. The upper outlet requires a valve.

"Fig. 30 shows the suction of the chimney applied at the level of the floor by carrying a pipe down.

"Fig. 31 combines two stories. An opening in the enlarged part of the ventilator in the upper story may be utilized for that room.

Fig. 31.

"*Air-Supply.*—The advice has been given to make the ventilation of a house depend on a single shaft. By doing so we avoid the possibility of having two shafts 'drawing against each other.' Two or more shafts, however, of equal height and equally heated, need not interfere with each other, provided each has a full supply of air. This point may be overlooked, with bad results, as it often is in the chimneys of dwelling-houses. . . .

"As school-houses now are, windows must be opened. In country districts, especially, both sashes ought to move easily up and down. In exposed places double windows are applicable; they must not be fastened, but must be freely movable. A double pair of sashes with the lower outer one raised and the upper inner one lowered gives a tolerably safe arrangement. Window-boards are often placed under the lower sash, filling the space entirely, the air in this case entering by the crack between the two sashes. Or the board may be set at the distance of an inch from the lower

sash, in such a way that when the sash is raised two inches the air is deflected upward. All such contrivances need to be watched closely, or they will occasionally give rise to dangerous draughts.

"It is a good plan to make the curtains roll at the bottom, so that the tops of windows can be opened freely in summer without injuring the curtains.

"Pierced window-panes, gauze shields to be placed before cracks in windows, Eureka ventilators (little slanting apertures in outer walls), and a variety of other contrivances, have more or less value, but do not meet the wants of school-rooms: if they let in a good supply it causes an unendurable draught. No window-supply can be sufficient in cold weather: a crack opened in every window and well watched is a proper measure; as a supplementary arrangement it should be an inflexible rule to devote five minutes at the close of each hour to some drill like light gymnastics, the windows being opened instantly at the beginning of the exercise and closed after it. At recesses the same should be done, and scholars should be made to leave the room. . . .

"Much has been made of the need for moisture in the air. In our climate moisture is so seldom abundant during the school-year that a dry in-door air is not noticed as a contrast. It is probable that good ventilation, with lowering of the prevalent excessive temperature, is what we need to relieve the confined, dull, oppressed feelings that are referred to 'burning of the air by furnaces.' At the same time there is some ground for complaint if furnaces are heated excessively or leak gas. The gas which escapes is deleterious, for it contains not only the sulphurous acid which gives it the pungent odor, but also some carbonic oxide, which is apt to cause headache. The weight of testimony at present goes to show that the latter gas is not likely to 'pass through the pores of cast-iron furnaces,' either black or red-hot. . . .

"The temperature of a school-room is commonly required to be about 68° F. in our climate; in Europe, about 60°, though

there is a difference between places. Judged from the latter standard, it is curious to find a regulation in Springfield, Massachusetts, that if the temperature does not exceed 60° F. half an hour after the opening of school, the class shall be dismissed. In summer there ought to be a regulation for dismissing when the thermometer reaches 82° or 85° F., or some point indicating that study is no longer profitable.

"A warmer for the feet should be placed in the entry-way. The writer has seen one large enough for twenty to stand on at once, composed of a plate of iron with steam coils underneath. . . .

"DRAINAGE AND SEWERAGE.

"*Effects of Air- and Water-Poisoning.*—The drainage of a building should be strictly scrutinized when there is a suspicion that the origin of a 'filth-disease' can be traced to the premises. This applies especially to outbreaks of diphtheria or other sore throat, pneumonia, dysentery, or diarrhœa, typhoid fever, scarlet fever, or measles.

"Foul smells may cause frequent annoyance, or even headache and sickness, for years before an outbreak of positive disease comes. The tendency of polluted air is to lower the general vitality. Air from sewers is 'sewer-gas,' and contains a variety of more or less injurious gaseous substances. The term 'mephitic poisoning' may be used to denote their bad effects.

"In an extreme degree the effluvia of drains and privies are rapidly fatal. In a school at Clapham, England, 'the clearing out of a privy produced in twenty-three children violent vomiting and purging, headache and great prostration, and convulsive twitchings of the muscles. Two died in twenty-four hours.'[1]

"'When the air of sewers penetrates into houses, and especially into the bedrooms, it certainly causes a greatly-impaired

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[1] Parkes's Hygiene, American edition, 1884, p. 146.

state of health, especially in children. They lose appetite, become pale and languid, and suffer from diarrhœa; older persons suffer from headaches, malaise, and feverishness; there is often some degree of anæmia, and it is clear that the process of aëration of the blood is not perfectly carried on. In some cases I have known decided febrile attacks lasting three or four days, and attended with great headache and anorexia.'

"'The air of sewers passing into houses aggravates most decidedly the severity of all the exanthemata, erysipelas, hospital gangrene, and puerperal fever; and it has probably an injurious effect on all diseases.' (Parkes.)

"It seems probable that the origin of typhoid fever generally depends on the drinking of water contaminated by drainage; yet there is reason to believe that drain-effluvia may cause the disease. 'In a case mentioned to me by a friend, an outbreak of enteric fever in a training-school was localized in certain parts of the school (whereas the drinking-water was common to all), and was traced to imperfection of traps in those parts of the house which were affected. In this case the drains led down to a large tank at some distance and at a much lower level, and the smell of the effluvia was so slight that at first it was not believed that the drains could be out of order.' (Parkes.)

"'A marked illustration of disease due to polluted air, when the drinking-water was pure, occurred in the school in this State, in 1864, where fifty-one out of seventy-seven young ladies in the institution were attacked with typhoid fever, of whom thirteen died; three servants also died of the fever. The vaults of the privies were shallow, filled to overflowing, and emitted a very offensive odor, which at times pervaded the whole building. The kitchen-drain discharged its contents on the surface of the ground, and a few rods from the school there was a foul barn-yard.' The school referred to was the Maplewood Institute at Pittsfield. The statement is quoted from a circular of the Massachusetts State Board of Health for 1879.

"The way in which typhoid fever may be caused by polluted drinking-water is well seen in the following case, given by Dr. John L. Leconte:

"The water-supply of a large and prominent boarding-school for girls was obtained from a river, and stored in two cisterns under-ground. The cisterns were built of heavy wooden curbs, with a timber floor, in which it became necessary temporarily to make holes, afterwards plugged up. The cisterns had brick cemented bottoms and linings, but the plugs projected inwardly through this masonry. The plugs were removed a year later, without the knowledge of the authorities, so that the ground-water had free access to the interior. Eighteen months later, this mistake (which by itself might have caused no harm) was supplemented by placing privy vaults outside of the building, one of which was placed eight or twelve feet from the cisterns. The vaults were of the supposed 'tight' kind, with nine-inch brick walls and bottom, heavily and carefully cemented, and arched over.

"In three years from this, typhoid fever broke out. Under medical direction, water taken directly from the river was substituted for the cistern-water, and the last case of the disease occurred ten days after this precaution was adopted. As an evidence that the use of the cistern-water was the sole cause, it is stated that, although numerous cases occurred among the children, and several among the teachers, not one occurred among the servants. The latter drank only tea and coffee, and very rarely used water, while the children (as usual) drank it freely at all times. Among seven absolute water drinkers six were attacked by typhoid.

"*Dysentery and Diarrhœa.*—There is sometimes difficulty in strictly separating these complaints; they have, moreover, in some degree, a common origin, and are spread by the fæces of patients infecting the air. More directly to the point is the case mentioned by Clouston, where it seemed to be proved that dysentery was produced in an (insane) asylum by the exhalations from sewage which was spread over the ground (a stiff

brick-clay subsoil) about three hundred yards from the asylum. 'The case seems a very convincing one, as the possibility of the action of other causes (impure water, bad food, etc.) was excluded.' (Parkes.)

"*Diphtheria.*—At Groveton, New Hampshire, an epidemic of diphtheria occurred in which the centre of infection was the school-house. Twenty-two cases broke out among the scholars in thirty-six hours, appearing at once in widely-separated places; one hundred and fourteen cases in all, with fourteen deaths. There were several circumstances which combined to make the school-house dangerous to health. A brook had been dammed by the boys so that in rainy weather it ran under the school-house, leaving at other times a stagnant pool. There was a boggy meadow near by, polluted by privies which had not been cleaned for two years. The refuse of a saw-mill and tannery was thrown into a mill-pond twenty rods distant; the water was drawn down to repair the dam, causing an intolerable stench; the outbreak of diphtheria followed, succeeded by typhoid fever; when the pond was kept full, the disease disappeared. . . .

"CONTAGIOUS DISEASES IN SCHOOLS.

"The diseases against the spread of which by schools it has been thought necessary to legislate are (in this country) chiefly small-pox, diphtheria, scarlet fever, measles.

"Whooping-cough, chicken-pox, mumps, German measles, are generally neglected in these precautions. Skin-diseases, as itch, ringworm, and vermin, are of some consequence, and yet, as involving no risk to life, they may be passed over by the legislator and left to the care of charity. The same has to be said of the far more important disease, contagious ophthalmia.

"There is abundant evidence of the facility with which these disorders are spread by means of schools. This being popularly known, the first step used to be to propose to close the

schools. Probably this has a good effect. But the real point to be aimed at, for the good of a community, is outside of schools, and consists in *isolating the patients.* When patients are also pupils, the function of the school as a co-worker with sanitary authority begins. . . .

"*General Regulations for Preventing the Spread of Contagious Diseases in Schools.*—1. Persons affected with diphtheria, measles, scarlet fever, or small-pox (or varioloid) must be excluded from the schools until official permission is given by the Board of Health for their readmission.

"2. Persons living in the family or house where such a case occurs are also excluded until similar permission is given.

"3. This permission is not to be given until sufficient time has elapsed since the occurrence of the last case to insure safety, nor until the premises have been disinfected under the direction of the Board of Health.

"4. If a child suffering from one of the above diseases attends school, the premises of the school must be disinfected under the direction of the Board of Health before they are used again.

"5. Physicians, teachers, school-officers, and school-children, knowing of such cases of disease, should at once report them to the Board of Health.

"6. The Board should also notify the school-authorities of such cases.

"7. Notice must be sent to the family by the school-authorities, acting conjointly with the Board of Health.

"It is hard to say with certainty how soon a patient may safely return to school. . . .

"The Medical Officers of Schools Association of England, in a code adopted January, 1885, name the following periods after which pupils who have had diseases may safely return to school.

"Scarlet fever, not less than six weeks from date of rash, *if* desquamation have completely ceased and there be no appearance of sore throat.

"Measles, not less than three weeks, *if* all desquamation and cough have ceased.

"German measles (rötheln, or epidemic roseola), in two or three weeks, the exact time depending on the nature of the attack.

"Small-pox and chicken-pox, when every scab has fallen off.

"Mumps, four weeks from commencement, *if* all swelling have subsided.

"Whooping-cough, after six weeks from commencement of whooping, provided the characteristic spasmodic cough and the whooping have ceased, or earlier *if* all cough have completely passed away.

"Diphtheria, not less than three weeks, when convalescence is completed,—there being no longer any form of sore throat, nor any kind of discharge from the throat, nose, eyes, ears, etc., and no albuminuria.

"Ophthalmia, until there has been a complete absence of discharge for at least one month, or until the inner surfaces of the eyelids are found on inspection to be quite free from granulations. . . .

"*Scarlet Fever.*—This disease is one of the most destructive. It is very contagious. It often leaves behind it very serious injuries, even after apparent recovery. To keep children from having it is a parent's duty, if possible. An instance of what the government may do in the way of checking it is probably furnished by the following account.

"The Boston Board of Health in 1877 established a regulation requiring children from infected houses to be kept out of public schools, and requiring physicians to report their cases of scarlet fever. Since that time the number of deaths from scarlatina has varied from year to year in the most irregular way. But, taking years by groups, it appears that the relative number of deaths has much diminished."

"Dr. J. Lewis Smith[1] refers to the important facts regarding

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[1] Archives of Pediatrics.

the propagation of this disease. It is contagious from the first day of its occurrence, continues so during desquamation, is probably propagated by ear-discharge if disinfectants be not used. Its area of contagion is limited,—but a few feet; on the other hand, the tenacity of its poison is remarkable, adhering to persons and things, and thus being carried by physicians, nurses, visitors, clothing that has been stowed away a length of time, letters, library books, and also being retained in the hangings, furniture, and wall-paper of rooms, etc. The gases generated by burning sulphur are proved to be not efficient, although Dr. Squibb suggests that it is because they are used in too dry a state. The sulphur should be burned in a room, with boiling water. Chlorine generated by the action of sulphuric acid on a mixture of common salt and black oxide of manganese is probably more efficient. But Dr. Smith asserts that methods for purifying rooms in which scarlet fever and diphtheria patients are confined can only be successful if preventive measures be employed during the continuance of the case. These consist in the use of disinfectants in the sick-room, or upon the patient from the beginning of the disease. Isolation and disinfection are the measures to be relied upon. The floor and walls of the room should be bare; none but doctor and nurse should enter it; all books, toys, etc., used by the patient should afterwards be burned; soiled clothing should be thoroughly disinfected; thorough ventilation secured; the air purified by vaporizing in a broad dish, over a gas or oil stove, two tablespoonfuls of the following mixture: carbolic acid, one ounce; oil of eucalyptus, one ounce; spirits of turpentine, six ounces; the vaporizing to be continued uninterruptedly. The body should be anointed every three hours with carbolic acid, one drachm; oil of eucalyptus, one drachm; olive oil, seven ounces. To the pharynx a solution of corrosive sublimate, two grains to a pint of water, may be applied as gargle or spray every two hours. It may also be injected into the nostrils. Articles of clothing should be disinfected. Physicians should be especially careful to preserve their clothing

from contamination, and to cleanse themselves thoroughly before visiting other patients. They should impress upon the family the importance of careful disinfection of the room on the termination of the case. In addition to the ordinary measures, it is advised to rub the walls of the apartment with slices of fresh bread which gather up microbes, and to wash, whitewash, or kalsomine the walls, ceiling, or floor with a solution of corrosive sublimate."

The Philadelphia Board of Health has issued the following regulations for the prevention and restriction of scarlet fever:

"Scarlet fever is a highly-contagious disease, directly communicable from one person to another, or by infected clothing, rags, etc., or by the discharges from the body of a person sick with the disease. It is always attended with a scarlet eruption on the skin, and is generally accompanied by a sore throat. When a child or young person has a sore throat and fever, and especially if it has an eruption of the skin, it should immediately be separated and kept secluded from all other persons except necessary attendants, until it be determined whether or not it has scarlet fever, or some other communicable disease.

"During the progress of this disease, not only the eruption of the skin, but everything that is thrown off from the body of the sick, contains the germs or seeds of the disease, which are capable of propagating it in another person. The discharges from the nose and throat are especially dangerous. The secretions from the kidneys, which are frequently seriously affected in scarlet fever, and the discharges from the bowels are also supposed to be capable of spreading the poison, and this power may be retained for a long time. When these secretions have found their way into cesspools, sewers, heaps of decaying organic matter, etc., they may be still capable of giving off the poison and of spreading the disease. It is, therefore, of the greatest importance to destroy the poison before it leaves the sick-room.

"Attendants upon persons suffering from scarlet fever, and also the members of the patient's family, should not mingle with other people, nor should children be allowed to enter a house in which this disease exists. Children not believed to be infected should be sent away from the house in which scarlet fever exists to families not liable to the disease; but they should be isolated from the public for at least fourteen days from the time of their removal. Children under ten years of age are in much greater danger of taking the disease, and after they do take it of dying from it, than are grown persons. But adults sometimes have the disease, and even though it be in a mild form, they may communicate the disease in a fatal form to children.

"In cases of scarlet fever the following directions should be carried into effect:

"1. Have the patient placed in one of the upper rooms of the house, the farthest removed from the rest of the family, where is to be had the best ventilation and isolation. The room should be instantly cleared of all curtains, carpets, woollen goods, and all unnecessary furniture. Keep the room constantly well ventilated, by means of open windows, and fires if necessary. Maintain the utmost cleanliness both with regard to the patient and in the room. A basin charged with chloride of lime, or some other efficient disinfectant, should be kept constantly on the bed for the patient to spit in. Change the clothing of the patient as often as needful, but do not carry it while dry through the house. A large vessel (as a tub), containing a solution of carbolic acid, in the proportion of four fluidounces of clear carbolic acid to the gallon of water, or a solution of chloride of lime, in the proportion of half an ounce of the best chloride of lime to the gallon of water, should always stand in the room for the reception of all bed and body linen immediately on its removal from the person or contact with the patient. Pocket-handkerchiefs should not be used, but small pieces of rag should be employed instead for wiping the mouth and nose; and

each piece, after being once used, should be immediately burned. Two basins, one containing a solution of the purer quality of carbolic acid, in the proportion of half a fluidounce to the quart of water, or of chlorinated soda, in the proportion of two fluidounces to the quart of water, and the other containing plain water, and a good supply of towels, must always be ready and convenient, so that the hands of the nurse may be at once disinfected and washed after they have been brought in contact with the patient. All glasses, cups, and other vessels used by or about the patient should be scrupulously cleansed before being used by others. The discharges from the bowels and kidneys are to be received, on their very issue from the body, into vessels containing some disinfectant, as a solution of four fluidounces of carbolic acid to the gallon of water, or of four ounces of the best chloride of lime to the gallon of water, and immediately removed. No person should be allowed to enter the room, except those who are necessarily attending upon the sick. A sheet moistened with a strong solution of carbolic acid, suspended outside the door of the room, or across the passage way leading to it, is useful to complete the isolation of the patient.

"2. Food and drink that have been in the sick-room should be at once destroyed or buried.

"3. Do not kiss a person who has a sore throat, nor take his or her breath. Do not drink out of the same cup, nor use any article that has been used by such person.

"4. For the purpose of preventing the spread of contagious particles from the surface of the body into the air, the skin should be anointed with oil or vaseline, commencing on the fourth day after the appearance of the eruption, and continuing every day until the patient is well enough to take a warm bath. These baths should be given every other day for four times. This proceeding should not, however, be adopted unless with the advice of the attending physician.

"5. Boiling is one of the surest ways of disinfecting all

contaminated clothing. After the clothing and bedding have been immersed for two hours in one of the solutions above advised for this purpose, they should be boiled for at least half an hour. Any material which cannot be washed without injury should be exposed to a dry heat of about 240° F., or fumigated in a closed chamber, as directed below. A hot-air disinfecting chamber has been provided on the hospital grounds, where beds, woollen goods, etc., may be disinfected under the direction of officers appointed by the Board. All articles which can be spared should be destroyed by fire. A furnace for this purpose has been constructed at the hospital grounds, and is at the disposal of the public, under suitable restrictions.

"6. Burial of the dead from scarlet fever should be private, and the body should not be exposed to view. Newspaper notices of such death should state that the deceased person died of scarlet fever.

"7. When persons have had scarlet fever, whether they get well or die, the room which they have occupied should be thoroughly cleaned and disinfected. The paper should be removed by moistening with carbolic acid solution, and the furniture and all surfaces should be thoroughly washed with a solution of clear carbolic acid, in the proportion of two fluidounces to the gallon of water, or of chloride of lime, in the proportion of two ounces to the gallon of water. The walls and ceiling, if plastered, should be whitewashed with lime-wash containing the same proportion of carbolic acid. The floors and wood-work should be then thoroughly scrubbed with soap and hot water. As an additional precaution, fumigation with sulphurous acid gas may be practised. It should precede the washing of the surfaces. Close the doors, windows, and all other openings, and burn not less than three pounds of sulphur for each thousand cubic feet of air-space in the room. In order to insure complete combustion of the sulphur, it should be used in the form of powder, or in small pieces, which should be placed in a shallow iron pan

upon a couple of bricks set in a tub partly filled with water, to guard against fire. The sulphur should be moistened with alcohol before it is set on fire. Chlorine gas may be used instead, and may be generated by pouring strong sulphuric acid upon equal parts of common salt and binoxide of manganese, to which some water has been added. Finally, the room should be well aired for several days, by throwing open the doors and windows.

"8. To disinfect a privy-vault or cesspool, use two and one-half pounds of chloride of lime for every eight gallons—or about one cubic foot—of fecal matter contained in the vault. It should be applied in solution.

"9. In regard to food and medicine, always rely on the advice of a physician, who should be sent for as early as possible."

"*Diphtheria.*—Children at school may take diphtheria from one another in a variety of ways,—by using the same cup to drink from, by the practice of putting pencils and marbles to their mouths regardless of whose mouths they may have visited previously, by turning pages of books with wet fingers.

"'Diphtheria may be diffused by the exhalations of the sick, by the air surrounding them, or directly by the exudation, communicated in the act of kissing, coughing, spitting, sneezing, or by the infected articles used, as towels, napkins, handkerchiefs, etc. The poison clings with great tenacity to certain places, rooms, and houses, where it may occasion cases after the lapse of months.'

"These opinions are quoted to illustrate the variety of the dangers that attend school-intercourse with an infected person. They are also pertinent in view of the doubt entertained by some as to the contagiousness of the disease,—a doubt honestly held.

"In epidemics of diphtheria all cases of sore throat must be looked on with suspicion, more particularly if the children are feverish and depressed. Teachers should take note of this.

"*Contagious ophthalmia* is of frequent occurrence in children's asylums, and occasionally in primary schools. It frequently causes blindness or great injury to sight. Its existence among the inmates of an institution as an epidemic is due to carelessness about admissions, to overcrowding, poor food, and other causes of enfeebled health. One of the chief ways in which it spreads is by the children's washing together in the same water and using the same towel.

"*Funerals* are a fruitful source of contagion. It may not be amiss to say that funerals *must not be held in the school-house*, as seems to be a custom in some places.

"Children who have been exposed to any contagion may be ordered to remain out of school for a limited time, in the judgment of the Board.

"Closing school is a measure that seems needless in a place where rules about exclusion are well enforced. It seems to have a beneficial effect sometimes, as the prohibition of public meetings does.

"It is doubtful if contagious fever is often carried by library-books; or, rather, the known cases must be very rare.

"In boarding-schools there ought to be a sick-room in the upper part of the house or in an isolated place. A pupil attacked with contagious disease should be at once isolated and all his effects disinfected. Communication of all sorts is to be cut off between pupil and comrades, and great care taken about food, clothes, and all things that come from the chamber. The parents are to be notified. If a considerable number of cases occur, or the disease is malignant, the parents of all pupils should be notified, that they may remove their children if they choose.

"The school should have its own medical attendant, who is to take all steps necessary in epidemics.

"It may be well to subject pupils to a delay, if when school opens it is found that they have been exposed to some contagious disease. This may prevent an outbreak in the school.

The period required may be as follows, dating from the day of exposure:

Diphtheria,	12 days.	Chicken-pox,	18 days.
Scarlatina,	14 "	Small-pox,	18 "
Measles,	16 "	Mumps,	24 "
German measles,	6 "	Whooping-cough,	21 "

CHAPTER XXXVII.

SURGICAL EMERGENCIES.

Children are frequently meeting with accidents, or emergencies of other kinds constantly arise that need immediate attention, and the parent or nurse is often obliged to turn surgeon for the time being. If one carefully reads at leisure moments what doctors call the "indications" for treatment and the proper methods of dressing wounds or of antidoting poisons or of resuscitating the asphyxiated, when the accident occurs he or she will know exactly what to do, and *keeping cool* under such trying circumstances, and doing the "right thing at the right time," will require no effort, but will come naturally.

BRUISES.

A bruise, which is a contusion of the soft parts, causes a rupture of the minute blood-vessels and blood is poured into the tissues beneath the skin. This, if not absorbed, will cause the "black and blue" appearance so characteristic. Of course, the later this color appears the deeper has been the contusion.

The *treatment* of a bruise consists in doing all in one's power to arrest the bleeding beneath the skin; thus preventing inflammation, causing absorption of the effused blood, and thereby also preventing discoloration in exposed parts of the body. Hot water, as hot as can be borne, and continuously applied, is the most potent remedy. Ice was formerly recommended; but

though it will check the bleeding, it congeals the blood already poured out and arrests the circulation, thus promoting instead of preventing discoloration: so nowadays heat is used instead. The part, if possible, should be bandaged, not too tightly, and the bandage soaked in a lotion of *tincture of arnica* one part, *water* three parts, or *distillate of hamamelis*, or, if very painful, one teaspoonful of *laudanum* to four tablespoonfuls of *dilute lead-water*. If the bruise is in the soft parts, not in a joint, and the skin is not broken, the part can be rubbed gently but firmly, after the application of a hot lotion, with any ointment like vaseline, tallow, or soap liniment, or chloroform liniment may be used instead. If the blow has been in the orbit and a "black eye" is feared, use hot water,—not hot enough to injure the eye,—and then cover the skin with an "alum curd," made by mixing powdered alum with white of egg.

The bruise of a joint—in other words, a sprain—must be treated by heat, as above, and by mild, soothing liniments or ointments; it should be loosely bandaged only to give support and not to interfere with the circulation, and then the joint must be kept at *perfect rest* till the doctor arrives. If it be a limb, it should be wrapped in a pillow and kept elevated, and kept moist by cloths wrung out in hot water and covered by oiled silk or waxed paper, or if the ankle or wrist be sprained, it can be plunged into hot water and kept there as long as bearable, this being repeated until the pain is relieved.

We cannot do better than quote at length from an excellent little book by Dr. Howard Barrett[1] on this subject.

"CUTS AND OTHER WOUNDS.

"These are of different kinds: there is the *clean* cut, as it is called, done with a sharp edged instrument; the *lacerated* cut or torn wound, done with a blunt-edged instrument or torn by a hook or other object; the *crushed* or *bruised* cut or

[1] The Management of Infancy and Childhood in Health and Disease.

wound, as in an injury from a blow with a stick, or a stone, or from the fall of a heavy weight; violent injuries from machinery, from being run over, and the like, are usually of this class; and there is the *punctured* wound, as from the bite of an animal, or from some sharp pointed instrument. Just as cuts and wounds differ in the way in which they are produced, so do they differ in their seriousness, in their way of healing, and in the treatment necessary for each.

" *Treatment of a Clean Cut or Incised Wound.*—There are three principal things to be done: (1) To stop the bleeding. (2) To clean the wound and remove extraneous matters, such as clots of blood, grains of sand or dirt, bits of glass, etc. (3) To adapt the lips of the wound and obtain union of its sides. The *first* point will be fully treated of in the section on the stopping of bleeding. The *second* object is usually accomplished by washing out the wound well with a stream of cold water and carefully sponging its sides with a soft sponge; but the majority of clean cuts do not need this, because no foreign matter has ever got into them. The *third* point is one of some importance. We should always try, if possible, to get the gash to heal by direct union of its sides; or, as doctors call it, 'to obtain union by the first intention.' This is partly a question of good management and partly one of good constitution. If the child's constitution is healthy, it will be easy to obtain direct union, even if the cut is a large one,—he has 'good healing flesh,' as they say. If his constitution is weakly and poor, it will be very difficult to obtain direct union, even if the cut is only a trifling one. Wounds healed by 'the first intention' leave no scar; those healing otherwise usually do.

" For ordinary small cuts of the fingers or hand, the best plan is to bind them up with a narrow strip of dry lint or linen rag, applied with moderate tightness and left on for twenty-four hours, after which time it may be detached by soaking in warm water. Longer and deeper cuts should have their edges brought together by strips of plaster, especially if they occur on parts of the body where there is space for the use of plaster. The

bleeding must first be stopped. Strips of plaster for uniting the lips of a wound of any size must be *long*, and *broad* enough to give support to the edges of the cut. Short, narrow strips are useless. Each strip must be attached first on one side of the cut, and then (a slight pull being taken on it, by which the edges are brought together) to the other. The strips of plaster, when once attached, should not be changed, unless they become loose; if they will, let them remain on until complete union is obtained. In taking off strips of plaster from a wound, loosen both ends at the same time, so that the middle of the strip, and not one end, is the last to leave the skin: in this way pulling the wound open again may always be avoided. Wounds sometimes are of such dimensions or in such localities that plaster either cannot be used or is not sufficient for the purpose. In such cases and in those in which it is necessary to bring the edges very accurately together to avoid scar and deformity, as in deep and large wounds of the face, sutures or stitches may have to be employed.

"*The necessity of the entire exclusion of air*, when we want a cut to heal by 'the first intention,' must be borne in mind. To this end, among others, we cover it with plaster or wet lint, as the case may be. But we possess a valuable agent in *collodion*,[1] a liquid largely used by photographers. If the edges of a cut that does not gape much are held together, while collodion is painted over them and over a little of the surrounding skin also, with a brush; and if they are so held for a few seconds, until the liquid is dry, it will be found that a firm, horny film is formed, which holds them in position by itself and effectually keeps out the air. The same end is attained by tying, or otherwise fixing, a small piece of lint soaked in collodion across the cut. In the same manner collodion may be applied as a sort of air-tight varnish over the strips of plaster dressing a wound, or over the spaces of a cut

[1] "It must be remembered that collodion will 'sting' the raw surface, so it should not be painted on the edge of a wound.

intervening between sutures, or over almost any small wound, provided it is done soon after the infliction of the injury, but not till the bleeding has entirely ceased.

"But perhaps, after all, the wound or cut will not heal by 'the first intention;' it shows no signs of uniting, and begins to look rather angry and to pour out either matter or a watery, yellowish-red fluid; or the edges of the wound may become red, swollen, and puffy, even though there is no discharge. What is to be done? Remove whatever dressings, plasters, or sutures may have been applied, wash it out with warm water, and apply either soft and warm linseed poultices or large pads of lint kept soaked in hot water and covered with oil-silk, for a few hours. Then keep applied to it cold-water dressings, by which is meant linen rag or lint kept constantly wet with cold water. In some cases, after all inflammation has subsided, the edges may once more be brought together by a strip or two of plaster, while a pad of cold-water dressing still lies upon them, above the plaster.

"Deep wounds of the palm of the hand are often dangerous from the great difficulty experienced in stopping the bleeding. No one but a surgeon can deal with them, but pending his arrival the lower part of the arm should be bent as much as possible upon the upper, and bound firmly in this position. This will have some effect in checking the bleeding.

"*Torn or crushed wounds* are usually more serious than clean cuts, and are always more difficult to deal with. They do not bleed so freely, but they nearly always inflame, and the inflammation may go on even to a limited mortification, or *sloughing*, of the wound. The fact of a wound being inflamed is rendered evident by the swelled, hot, dry, and glazy appearance it presents, and by the heavy, throbbing pain felt in it. If by chance the inflammation goes on to *sloughing*, the pain and swelling will usually greatly diminish, the wound will begin to assume a dark and livid hue, to pour out a thin, brownish fluid, and to smell very offensively. The usual progress of such a case is for the dead portions of tissue then

gradually to come away, after which the wound slowly fills up and heals.

"*Punctured Wounds.*—It is very seldom that these will heal by 'the first intention.' Complete rest of the part, dressings of lint, kept constantly wet with cold water,[1] and support by a bandage applied with moderate firmness, give the best chances of a favorable healing. If the wound, or wounds, begin to pour out matter, use hot linseed poultices, instead of the cold dressings.

"*Grazes of the skin,* or places whence pieces of skin have been chipped off, are best treated, if seen very shortly after the injury, by just once brushing the surface over with collodion, carbolated vaseline, or benzoated oxide of zinc ointment. Either of these protect the surface from the air, the former by a hard film, and the latter by a scab, under which the skin soon forms again. These remedies are rather too sharp, however, for an infant. If the graze has not been seen till it has been done some time, or if it occurs in the case of an infant, it may be kept dressed with a piece of lint, spread with oxide of zinc ointment, which must be changed daily till it heals.

"ON THE STOPPING OF BLEEDING.

"If, as the result of some accident, a child bleeds rather freely, alarm, excitement, and confusion usually reign supreme in the house, until the flow is stanched. This may be natural, but the alarm is generally groundless, and the excitement is mischievous and obstructive of good management. Of course, with such tender and fragile beings as infants and young children, it is essential that bleeding should be speedily stopped; but still the mother may take courage and comfort from the assurance that by following closely the advice about to be given, she herself may always succeed, on an emergency

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[1] "Into which a few drops of creolin have been put.

and if no surgeon is at hand, in stopping almost any bleeding that is not caused by the wound of *an artery;* and even this she may often control, until assistance arrives. If an artery is wounded, it is known by the blood spouting up in the air in successive jets of bright crimson, a jet for every beat of the heart.

" *The remedies at our disposal* are: (1) *Cold*, either in the form of ice, cold water, or a free exposure to the air, or water as hot as can be borne. An excellent plan is to let the hot water from the bath-room spigot run over it. (2) *Styptics*, or drugs whose application coagulate and stanch flowing blood, such as the strong acid tincture of iron. (3) *Pressure*, either in the form of pads and bandages, or of the finger pressed firmly on the bleeding point. (4) *Ligature* of the part injured—if it be the arm or leg, finger or toe—nearer to the body than the injury.

" Of course many other methods are at the command of surgeons.

" *What to do.*—The first thing to do is to nerve yourself to steadiness and self-control, and as far as possible to dismiss all alarm as to the amount or continuance of the bleeding. It is surprising how much show and mess a little blood will make. If the bleeding is rather free, do not attempt to stop it by covering it up with rags and handkerchiefs,—this is worse than useless,—but expose it freely to the air, and let a stream of cold water (the colder the better) or of hot water, and the hotter the better, pour over it for a time. This course, if persevered in for a time, will nearly always moderate or altogether stop the bleeding. But supposing that it only moderates it, or entirely fails to abate it, what then? Make a thick, hard pad of dry lint or linen rag, not much larger than the wound, place it upon the bleeding orifice, and bind it *tightly* on with a few turns of calico bandage. If this stanches the blood, as it generally will, do not remove it for several hours, and when you do, *soak it off* very carefully in tepid or warmish water. If the bleeding continues to go on uncon-

trolled, in spite of the pad and bandage, take them off again; wash the wound clean with cold water; make another similar pad, but this time steep it in distillate of hamamelis, or Pond's extract, and if this fails the strong acid tincture of iron (called by druggists *liquor ferri perchloridi*), if available; if not, in creosote, or in turpentine, or in a strong solution of tannin in water; wipe the wound dry and apply the pad, binding it tightly on, as before, with a bandage.

"*If an artery is wounded*, the jet of bright blood spouting out with each pulsation of the heart, as above described, is seen; and it is never seen unless an artery *is* wounded. This is a most serious accident, and can only be treated by a surgeon, who must be sent for with all speed. Meanwhile, if nothing is done, the child may bleed to death. Binding up the wound with a pad and bandage is utterly useless, so are all styptics. Cold may do us a good turn; therefore let the wound remain exposed to the air. If the point from which the blood spouts can be seen, simply place the finger firmly upon it and keep it there unfalteringly until assistance arrives. Bleeding from a small artery can thus be held in check for any length of time by a sensible person of ordinary nerve; but if the bleeding is from a larger artery (evidenced by large jets of blood), or if no one at hand is possessed of sufficient sense or nerve, a strong silk handkerchief must be tied so tightly round the injured limb somewhere between the injury and the body, as to stop the circulation. If the handkerchief cannot be tied tightly enough, insert a strong, smooth, round stick between the handkerchief and the skin, and twist it round until it screws the bandage sufficiently tight to prevent the flow of blood. If ice can be obtained, place some upon the wound; it will tend materially to check the bleeding."

But as the most important part of the treatment of wounds is that immediately following the injury, we will impress upon the reader still further the details of their management, and quote from Dr. Charles W. Dulles as follows:

"DRESSING-MATERIALS.[1]

"Wounds may be rendered aseptic by washing with boiled water and sometimes by the application of solutions of corrosive sublimate (one to two thousand) or carbolic acid (one to one hundred), after which they may be strewn with powdered iodoform or naphthalin or bismuth, while pulverized white sugar or powdered sulphur may be used for the same purpose. After this they are covered with an aseptic layer of gauze or absorbent cotton or fine jute, over which is placed an impervious layer of rubber tissue or waxed paper, the whole being retained by a suitable bandage.

"Such dressings often remain in place until a wound is healed, or until some rare accident demands their removal for inspection of the wound.

"*Antiseptic gauze* is composed of cheese-cloth thoroughly boiled and impregnated with corrosive sublimate or iodoform, and can be procured at a very moderate price from any instrument-maker, or can be made without much trouble.

"*Lint* is now used chiefly in making wet applications or to hold ointments, when its bulk, softness, and uniform texture are of advantage.

"*Absorbent cotton*, *jute*, and *fine carded wool* are used to make and maintain uniform and equable pressure: they are usually applied over the dressing of gauze, or over its protecting rubber tissue or waxed paper.

"*Bandages* are made of soft muslin or flannel, and, as a rule, they are more comfortable and easier to apply if of cheap and rather open-meshed material.

"*Splints* are made of thin metal, very light wood, binder's board, or felt fabric. Many useful splints are obtainable from the instrument-maker; but there are few cases in which a perfectly suitable splint cannot be made out of thin strips of pine wood, or pasteboard obtained from boxes or, if necessary,

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[1] Keating's Cyclopædia of the Diseases of Children, vol. iii.

from large books. The function of splints is often overestimated, and a little ingenuity will usually secure satisfactory means of fixation and support anywhere.

"*Adhesive plaster*, as now in use, is made of resin plaster or rubber plaster spread upon strong twilled cotton cloth. The latter is often preferable to the former because it does not require heat for its application; but it is less desirable when the plaster must remain long on the skin, as it is likely to give rise to the formation of an acneform or eczematous eruption. In removing adhesive plaster dressings, it is especially important in the case of children to remember that it is not always necessary to remove all that has been used, and that it may suffice to cut through the strips over or near the wound, leaving the sides undisturbed, and placing any new strips that may be needed over and upon the old ones. Much irritation may be saved a patient in this way. It is also well to remember that when a strap crossing a wound is to be removed, the proper plan is to loosen it from both ends and draw on them towards the wound, and *never away from it*. Another little point of importance is that the removal of an adhesive strip is less painful, as a rule, if it is done quickly and with a steady pull, instead of slowly and by jerks; also, that to pull in the direction of the hairs causes less pain than to pull against it.

"THE CLEANSING OF WOUNDS.

"It is a cardinal point of modern surgery that no wound shall be dressed until it is perfectly clean. This rule may sometimes be relaxed in cases in which nature has already covered a wound with a healthy scab, and sometimes after machinery accidents, when the grime which accompanies them is very tenacious. But in most cases, and especially in the wounds of children, a preliminary cleansing is imperative. This can often be effected by touching or pressing the part with dry absorbent cotton, or cotton which has been moistened and then squeezed nearly dry, or lint, or either of these very

slightly moistened; actual lavement is by no means always necessary. When actual washing is required, there should be two vessels, one to contain the water and another to receive it as it flows from the part. The water may be conveyed through a small hose, or may come directly from a spigot, or it may be allowed to fall in a steady stream from a sponge or a mass of cotton, squeezed in the hand, the size of the stream being regulated by the compression, and its force by the height at which the hand is held. . . .

"DRESSING OF WOUNDS.

"Nature's method of protecting wounds is by the process of scabbing; and when we reflect upon the successful way in which this operates in the lower animals, and often in man too, we may wonder that it should be almost a matter of routine to remove scabs in surgical practice. It may gratify our curiosity, it may even aid our study at times, but it is often of no advantage to the patient, to remove from a disfigured face or a cut head the crusts which are nature's reliable antiseptic dressings. It is often well to leave such crusts undisturbed, and, if they are objectionable in an æsthetic sense, simply to cover them with something better-looking. An artificial scab made with lint, or tarlatan, or thin muslin, and collodion, forms one of the best dressings which have ever been devised for simple incised and not a few lacerated wounds. Many cut heads and simple incised wounds go to a prompt and uninterrupted healing under the first dressing of this sort. Efficient scabs may be formed by allowing lint to become saturated with the oozing of a wound exposed to the air. Dry powdered borax, or boric acid, or iodoform, may also be used to promote the formation of a crust. In all these cases, however, it is important to watch lest the crust bind down offensive discharges, as any scab may do: when this happens, the crust must, of course be removed, and the wound cleaned."

For this reason it is a mistake for an attendant to immedi-

ately put adhesive plaster over a wound. A wound, especially of the head, should be carefully washed and dressed with a dry antiseptic dressing till seen by the doctor.

"Lead-water and laudanum is but little better than cold water, so far as my experience would indicate, although it is suited to cases in which there is much heat and pain. This dressing ought never to be covered up, as it very often is, with impervious coverings. Pure laudanum is often a very soothing application.

"Dilute alcohol is a refreshing dressing, if it be allowed to evaporate and be removed at the first sign of pain.

"The ointments in use in simple surgery are very numerous. The best are fresh cold cream, vaseline, oxide-of-zinc ointment, and equal parts of this and carbolic-acid ointment. The latter are stimulating in their action. A piece of lint or muslin should be spread with the ointment and trimmed down to the exact size of the sore. If spread on the adjacent skin, it will often after a while set up an artificial eczema, very annoying to the patient."

Dr. Dulles in his excellent paper continues as follows, and, as the language is clear and forcible, we cannot do better than repeat it.

"EMERGENCIES.

"The accidents and emergencies to which children are liable are different from those of adults, in that there are some to which the former are more exposed than the latter, and some to which children are not liable while adults are. The most usual emergencies in children we will consider, taking those which are more or less surgical in their nature and omitting those which are purely medical.

"OBSTRUCTIONS TO RESPIRATION.

"*Drowning, Strangulation, Suffocation.*—In cases of drowning, if natural breathing has ceased, the first thing to be done is to free the body from any clothing which binds the neck, chest,

or waist, and to turn it over upon the face for a moment, thrusting a finger into the mouth and sweeping it round, to bring away anything that may have got in or accumulated there. Then the body should be laid out flat on the back, with something a few inches high under the shoulders, so as to cause the neck to be stretched out and the head to be carried well back. The tongue should now be drawn forward out of the mouth and held by an assistant, or, if there be no one to do this, a pencil or small stick may be thrust across the mouth on top of the tongue and back of the last teeth, to keep the mouth open and the tongue out of the throat. A very good way to get the base of the tongue clear of the windpipe is to carry the head well back from the chest and to press the angles of the jaw forward with both thumbs applied just behind the rami [bones] of the lower jaw-bone.

"To secure artificial respiration the operator should place himself on his knees behind the patient's head, seize both arms near the elbows and sweep them round horizontally, away from the body and over the head, till they meet above it, when a good, strong pull must be made upon them and kept up for one or two seconds. This effects an inspiration. (Fig. 32.) The second manœuvre consists in returning the arms to the anterior surface of the chest, and making strong pressure against the lower ribs, so as to drive the air out of the chest and effect an act of expiration. This need occupy but a second of time. (Fig. 33.) Another plan is to hook the fingers under the ribs and draw them up firmly, though gently, and then release them.

"If either of these plans is regularly carried out, it will make about twenty complete acts of respiration in a minute. It should be kept up for a long time, and not abandoned until recovery of natural respiration or until the heart has ceased to beat. The cessation of the pulse at the wrists must not be taken for a sign of death. Often life is present when even an acute ear cannot detect the sound of the heart. Deep pressure with the finger-ends just below the lower end of the sternum

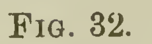

FIG. 32.



FIG. 33.



may sometimes reveal pulsation in the aorta when it cannot be found anywhere else.

"Wet clothing should be removed from a drowned person as soon as possible. This can always be done without interrupting the artificial respiration or exposing the person. Something may be laid over the body and the wet clothes loosened under it and drawn down over the feet. Then the body may be quickly slipped on to something dry, and covered with some other fabric, if the first has become wet, while this, in its turn, is pulled away from underneath.

"Warmth is to be secured by any means which ingenuity may suggest,—hot bottles, or plates, or bricks, or stones, or even boards that have lain in the summer sun. At the seashore there is plenty of hot sand, and often plenty of baking bathing-costumes. The body and limbs may be gently, but constantly, rubbed towards the heart, to help the blood in its labored circulation. None of these things need interfere with the efforts to secure respiration, which must be uninterrupted.

"Some stimulant is to be given as soon as it can be swallowed. Half-teaspoonful doses of whiskey or brandy, in two teaspoonfuls of hot water, may be given every ten minutes, till an ounce has been taken.

"As natural respiration begins to be attempted, it should be aided as much as possible by timing the artificial to it. It may be stimulated by carefully applying smelling-salts, or hartshorn, to the nose, by slapping the skin lightly but smartly, or by dashing hot water upon the chest. Where it is available, there is no stimulus to respiration better than that of a good faradic battery used so as to cause a reflex sobbing, or deep breathing, by the pain it causes. Little by little natural breathing will take the place of the artificial; but it must not be left unwatched for some time.

"Nothing but danger from cold, or pressing necessity, should prompt the removal from one place to another of a child who is being resuscitated, before this has been thoroughly accom-

plished. If removal cannot be avoided, it must be effected with great care. After resuscitation the child should be put in a warm bed, being carried carefully, with the head low, and a watch should be kept to see that the breathing does not suddenly stop.

"Where natural breathing has not ceased, all the steps just described should be carried out, with the exception of artificial respiration. But this should be had recourse to upon the first evidence that natural respiration is failing.

"*Strangulation by hanging*, or by anything which compresses the trachea [windpipe] from the outside, is to be treated by *re-establishing the respiration in the same way as for drowning.* The obstruction is, of course, to be removed, and natural respiration stimulated or artificial respiration employed. Hanging is not an unheard-of accident with children, as they may hang themselves accidentally, and a child has been known to hang a younger one in imitation of what it had heard described by its parents.

"*Suffocation with noxious gases or vapors* calls for instant removal to the fresh air and for the establishment of natural respiration, or of artificial until the natural is re-established, *as described in speaking of drowning.*

"*In strangulation caused by a foreign body* in the throat, œsophagus [gullet], or trachea, it is not always easy to tell which of these passages is clogged, but usually there is an active irritation, with coughing, when a foreign body lodges in the larynx or trachea, while swallowing can be done quite readily. On the other hand, when the œsophagus is stopped it is usually impossible to swallow, and there is little or no tendency to cough, no matter how much the breathing may be interfered with. Foreign bodies in the fauces or larynx are not so hard to discover.

"If a foreign body be within reach of the fingers, it may often be easily removed. If not, a pair of forceps may be used, or, in a pinch, a pair of blunt-pointed scissors. Or a hair-pin may be straightened out and one end bent round so as

to make a loop, and this used to dislodge the foreign body; or the handle of one blade of a pair of scissors may be used in the same way. It has been stated that for foreign bodies in the throat, such as pieces of meat, etc., a simple mode of relief is to blow forcibly into the ear. This sometimes excites powerful reflex action, during which the foreign body is expelled. Such a plan is so easy of execution that it is certainly worth trying.

"Children not infrequently get buttons, coins, or marbles in their throats. These may be often pulled out or expelled by vomiting induced by titillation of the fauces, or by an ordinary emetic. Holding the body up by the legs, with the head hanging down, may sometimes aid other efforts to get rid of such things. Attempts to push the foreign body down may prove successful.

"If foreign bodies get into the larynx or trachea, a moderate blow on the back with the open hand, or a quick strong squeeze of the chest, sometimes aids the coughing act; and inverting the body may assist in dislodging the foreign body if it be not too tightly wedged in.

"When coins, marbles, slate-pencils, or nails are swallowed by children, it is usually a mistake to give an emetic or a purgative. The proper plan is to *let the bowels alone and to give plenty of good solid food,* especially vegetables, so that the foreign body may be surrounded with the waste and carried out of the body without injuring the walls of the intestines.

"FOREIGN BODIES IN THE EYE, NOSE, AND EAR.

"*Foreign Bodies in the Eye.*—Small substances, like cinders, dust, or small chips of stone or metal, can often be removed from the eye by very simple means. Sometimes the flow of tears washes them out. At other times catching the upper lid by the lashes and pulling it away from the eyeball and down over the lower lid, then letting it go so that as it recedes its under surface is swept by the edge of the lower lid, will

clear it out. If this does not prove successful, a loop made of a horse-hair or of a long human hair can be passed under the lid and swept from the outer side towards the nose and drawn down. This may serve the purpose. If it does not, the upper and lower lids must be everted and examined with a good light and the aid of a lens if necessary.

"The eyeball must also be examined and any foreign substance removed.

"One must be on his guard against the sensation which is sometimes left after a foreign body has been removed from the eye. But a most careful search should be made before this is taken to be a self-deception.

"After removing a foreign body from the eye, the irritation may be sufficient to demand cool, wet applications, or even anodynes. Nothing is better than a thin mucilage of pure, clean gum-arabic poured freely in the eye. A bandage loosely applied often does much good.

"When lime gets in the eye, the eye should be deluged with water, and a little vinegar or lemon-juice and water (a teaspoonful of vinegar or lemon-juice to a teacupful of water) poured over the eyeball.

"*Foreign Bodies in the Nose.*—Children sometimes place, or have placed, in their noses small bodies, such as marbles, buttons, peas, beans, or small grains. To get rid of them the nose should be blown hard, or sneezing may be excited by tickling the nose or giving snuff, or the child may be told to take a full breath and then be given a smart blow on the back. Some one of these plans may dislodge the foreign body. If it does not, the affected nostril may be closed while the other is blown into, through a rubber tube, and on suddenly releasing the closure of the side occupied by the foreign body it may be driven out. If none of these methods succeed, instrumental extraction will be required.

"*Foreign Bodies in the Ear.*—The removal of foreign bodies from the ear is so delicate an operation that, when possible, a specialist should be asked to do it. . . .

"If live insects get into the ear, oil or glycerin or salt-and-water should be poured in. Or a plug of cotton soaked in a strong solution of salt and vinegar may be placed in the ear and the head turned over on that side. A method which has sometimes been successful is to turn the ear to a bright light, so as to tempt the insect to back out.

"LOSS OF CONSCIOUSNESS, AND CONVULSIONS.

"*The treatment* suitable for all cases in which there is doubt as to the cause of unconsciousness is to secure quiet and rest, the body being laid upon the back, with the head a little raised. If there be great paleness and a cold surface, with slow, sighing breathing,—the signs of prostration,—smelling-salts or hartshorn may be held under the nose, hot tea or coffee given, and heat applied to the body. If there be great heat of the surface, cold may be applied to the body and head, and cold drinks given.

"*Fainting.*—A fainting person must be laid out flat at once, so that the heart may not have to work against the force of gravitation in sending blood to the brain. Sprinkling water upon the face and holding smelling-salts to the nose tend to excite the nerves of sensation and rouse the brain and heart to renewed activity. Nothing else is usually necessary; though if a person is very slow in coming to, it may be well to apply heat in the form of a mild mustard plaster or hot moist cloths to the pit of the stomach.

"*Hysterics* are best treated by the exercise of calmness and patience, sometimes by taking no notice of the attack, or by leaving the sufferer in a room alone. Heroic measures, like dashing water into the face, are not to be generally recommended. Good is sometimes done by giving valerian or Hoffmann's anodyne.

"*Epileptic fits* are to be treated very much like fainting-fits, because in them also the brain is temporarily bloodless. At the same time, any movements calculated to injure the person

must be controlled. There is no use in struggling against such as will do no injury; they had better be simply regulated, and no attempt made to prevent them entirely; but a piece of folded cloth or a piece of soft wood may be—if it can be—thrust between the teeth, to prevent the usual biting of the tongue. When the height of the convulsion is passed, rest, quiet, and perhaps a moderate stimulation may be secured. Here again the flat position of the body must be maintained.

"*Convulsions* of children and infants are generally (in the absence of brain- or kidney-disease) due to some irritation of the digestive apparatus or to teething. They are usually preceded by some other evidence of irritation, such as restlessness and fretfulness. The spasms may affect the whole body at once, or only a half, or only one limb at a time. The eyeballs sometimes roll about or squint, or, they are turned far up, so that only the lower part of them can be seen.

"When convulsions occur, the child should have cold applied to the head and heat to the body. It often seems to do good to place it in a tub of hot water to which some mustard has been added. A large injection of hot soapsuds should also be given, to clear the bowels out, and, if possible, an emetic, in the hope of removing any cause of trouble from the stomach. . . .

"INJURIES TO THE BRAIN.

"*Concussion of the brain* may be caused by blows or falls on the head, or even by falls upon the feet or the buttocks. In such cases there is sickness, sometimes fainting, with paleness and depression. There is also usually confusion of ideas, and the sufferer cannot talk continuously and coherently. There may even be unconsciousness.

"The proper treatment for this condition is rest in bed, quiet, and plenty of fresh air. If the skin becomes cold and clammy, heat should be applied to the body and limbs. No whiskey or brandy should be given. . . .

"EFFECTS OF HEAT.

"*Burns or scalds* are usually dangerous in proportion to their extent and depth. Those which involve as much as half the surface of the skin are almost necessarily fatal.

"After an extensive burn or scald, so much of the clothing as has to be removed must be clipped away, so as not to burst blisters that have formed. These may be punctured at one edge and their contents allowed to run out, and the elevated cuticle to fall down upon the deeper layer. Then a dressing of pure sweet oil, castor oil, or vaseline is to be applied on strips of soft old linen, and disturbed as little as possible afterwards. Iodoform is a very soothing application to burns, either in powder or in an ointment; although its prolonged use has a tendency to promote or prolong suppuration. Carron oil [linseed oil and lime-water, equal parts] is also an excellent application, and stimulants or anodynes may be given as required. In case of a severe and extensive burn, the entire body may be immersed in a bath, to be kept at a temperature of 100° F.

"Slight burns or scalds are best treated by applying a cloth soaked in a strong solution of baking-soda—the bicarbonate—in the proportion of a heaping tablespoonful in a teacupful of water, or it may be powdered on without using any water. Carron oil is a good application for such burns. So is the white of egg. In an emergency damp earth may be used, or white-lead paint. Anything may be used which will prevent friction and exclude the air; but nothing should be used which will stick in cakes and prevent after-examination or make this very painful. For this reason flour and cotton batting, though often recommended, had better not be used. For small burns, simple cool water is better in every way than these. Indeed, for any but the most extensive burns it is one of the best remedies: an arm or a leg can be immersed in it and left there a long while with great advantage.

"*Burns with acids* must be deluged with water and then treated like other burns.

"*Burns with caustic alkalies*, such as soap-lye, should be treated with an application of vinegar, followed by applications of oil.

"*Burns with Hot Pitch.*—After such burns the pitch often sticks. In such a case it ought not to be removed immediately unless in excessive amount.

"*Sunburn*, and the burns caused by external applications, like mustard, may be treated very successfully with bicarbonate of sodium. This may also be mixed in equal parts with vaseline, cosmoline, or lard from which the salt has been boiled out, and used as an ointment.

"*Sunstroke*, or more properly *heatstroke*, is not usually due to the direct rays of the sun, but rather to a prolonged elevation of the bodily temperature, especially in confined places. When it takes place in the open air it is apt to be on oppressive, heavy, or murky days. It is generally preceded for some time by pain in the head and a sense of oppression. The attack, however, culminates in loss of consciousness, with heavy, labored breathing, and an intense burning, dry heat of the skin, while the bladder and bowels are often involuntarily evacuated. The absence of perspiration in the presence of so great heat is one of the most characteristic symptoms of heatstroke.

"The treatment consists in first lowering the temperature. As much of the clothing as practicable must be removed, and the patient should be transported to a cool and airy place, if possible. Cold must then be applied to the head and body and ice may be rubbed over the chest and placed in the armpits. Pouring or dashing cold water over the body is not to be advised, as it conveys a needless shock to the system; but there is nothing better than to place the body in a cold bath, or to wrap it in sheets kept wet and cold by renewed applications of cold water or ice. The temperature of the body must be watched, as there is some risk of pushing its reduction too far. When the temperature has been brought down to 100° F. or consciousness has returned, the cold may be discon-

tinued, to be renewed only if the surface becomes again very hot.

"*Heat-Exhaustion.*—This is a condition of great depression of the system due to the action of heat, and, occurring in hot weather, it might be confounded with sunstroke or heatstroke. But in heat-exhaustion, instead of a hot, dry skin, there is a cold, moist one. This calls for rest, fresh air, and a cool apartment, but for no application of cold to the surface. Small doses of brandy or whiskey thoroughly diluted may be given, and the system gradually brought back from its depression.

"*Lightning-Stroke.*—This is marked by evidences of shock, with reduction of the force of the circulation, weak pulse, and slow, sighing breathing. It is to be treated with rest and stimulants, and warmth applied to the body.

"EFFECTS OF COLD.

"Freezing is best treated by gradually bringing the temperature up to that which is normal and maintaining it there. When fingers or toes are frozen or frosted, warm baths and gentle friction are to be used, afterwards covering with a thick, hot poultice. In such cases gangrene not infrequently follows the freezing. Frozen ears or noses are of less frequent occurrence, but must be treated on the same principles.

"If the whole body has been exposed to extreme cold, there will follow a depression which requires the most cautious treatment. To restore its warmth is the first demand, and for this a warm bath, made gradually warmer until as hot as can be well borne, surrounding with heated blankets, or exposure before an open fire, may be used.[1] At the same time, stimu-

[1] "This recommendation is contrary to popular belief, and contrary to what is taught in most text-books, as well as in books on the treatment of emergencies. But it has been proved to be correct by experiments made in Russia, where it was found that the best way to resuscitate dogs which had been frozen was to put them at once into a hot bath. Of twenty

lants may be given internally, such as hot tea or coffee, with the addition of small quantities of spirits.

" SPRAINS.

" Sprains of the fingers or of the wrist require cold and moist applications. In the latter the hand and forearm should be covered with cotton, bandaged smoothly, and laid on a straight splint and lightly secured to it with a soft bandage or broad strips of sticking-plaster. One of these should go round the hand and one or two round the forearm above the wrist,—not over it. Sprains must be treated by rest, and by heat or cold, whichever gives the most comfort.

" Sprains of the ankle are not infrequently complicated with a fracture of one of the malleoli [ankle-bones]. This complication may give rise to much trouble, and requires very skilful and patient treatment. The general principle in the case of a sprained ankle is, first, to put the joint at complete rest, to allay inflammation if it arises, and afterwards to promote the absorption of inflammatory products. The foot and ankle should be covered with cotton or carded wool and a bandage carefully and smoothly applied. The use of a splint may usually be dispensed with, if the bandaging is well done. The dressings may remain undisturbed for days if the ankle is comfortable. If the dressings become loose from rapid diminution of the swelling, they should be removed and reapplied. When this is done, careful massage or douching with alternate streams of hot and cold water may be useful. . . .

" WOUNDS.

" Wounds may be classified as contusions, contused, lacerated, punctured, poisoned, incised, and gunshot wounds.

" *Contusions* are best treated at first, when painful, by the

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animals treated by the 'gradual' method in a cold room, fourteen died; of twenty introduced at once into a warm room, eight died; of twenty placed immediately in a hot bath, *all recovered.*

application of cold wet cloths. Pure laudanum is often a very acceptable application. Later, when the pain has subsided, hot wet cloths are best, as they favor the carrying off of the blood that has escaped.

"In contusions of the chest or abdomen internal organs may be injured. Evidence of this may be seen in spitting of blood, or vomiting it, or passing it from the bowels or from the bladder; or there may be great depression. In such cases complete rest must be secured, and the strength of the sufferer sustained by means of warmth applied externally and careful stimulation internally, until the nature of the injury is exactly made out and a suitable line of treatment may be adopted.

"*Contused Wounds.*—These are cuts or tears accompanied with bruising of the tissues. They are to be treated like lacerated wounds. Unless they bleed freely, warm applications are better suited to such wounds than are cold ones.

"*Incised wounds*, if simple and small, call only for a piece of adhesive plaster and perhaps a bandage. If large, the edges should be brought as near together as possible, and supported so by adhesive plaster or by bandages. If an entire part be cut off, as an ear, a nose, a toe, or a finger, it should be cleaned with lukewarm water, and put in its place, with sutures, bandages, and a splint. Some very remarkable cases of reunion of such parts are on record, and an attempt to save them is not to be lightly rejected.

"*Lacerated Wounds.*—In lacerated wounds the torn parts can be placed as nearly as possible in their natural position (after removal of any foreign matters that have entered them) and covered with cool wet lint, or with lint soaked in laudanum or in alcohol and water. If the tear has been very great and the sufferer is depressed and cold, teaspoonful doses of brandy or whiskey in hot water may be administered, and lint wrung out of hot water placed over the injured parts.

"*Punctured wounds* are made with sharp-pointed objects, like arrows, pins, needles, tacks, fish-hooks, glass, thorns, splinters, or teeth. . . .

"Fish-hooks may be removed by a simple incision, or the string may be cut and the point of the hook pushed through the skin and the whole drawn out, as a needle would be in sewing. If it can be done, the broad part of the hook may be cut off before trying this. But this is usually not easy for the operator or the patient.

"Splinters are dangerous in proportion to their size and according to the part they enter. Small splinters may be picked out with a needle. Splinters under the nails may be removed by scraping the nail as thin as possible over the splinter, then splitting it or cutting a little tongue out.

"Splinters of glass must be removed by incision, and the wound treated on general principles.

"Splinters in the eye should be removed with the greatest care, and, if possible, by a specialist. Afterwards the eyelid should be gently closed, both eyes covered with a layer of absorbent cotton soaked in cool water, and a bandage placed round the head, so as to keep the lids as still as possible. This bandage should not be too thick nor put on too tight, and the application should be kept cool, with ice, if need be.

"*Poisoned wounds* are usually punctured, and result from the bites or stings of animals or insects.

"The bites of venomous serpents usually demand the prompt removal of the part bitten. It may be cut out instantly. Before this the part should be encircled above the wound with a tight ligature, and, if small enough, thrust into the mouth and sucked hard, so as to extract the poison. Cauterization may be effected with anything at hand, like a knitting-needle or a nail, heated to redness. Stimulants may be administered if necessary.

"The stings of tarantulas, scorpions, centipedes, etc., are to be treated with cold, and hartshorn applied to the point where the sting entered.

"The stings of insects may be treated with cold, wet alkaline applications: wet earth is a very good one. The application of a drop of hartshorn or some wet salt often gives great relief.

"The bites of cats and rats are sometimes followed by severe inflammation. The treatment consists in cleansing the bites, and treating them as lacerated wounds.

"*The Bites of Dogs.*—If any one be bitten by a dog in good health, only the simplest treatment will be necessary. If the dog be sick, local inflammation or severe constitutional disturbance may follow. In case of reasonable suspicion, the wound may be thoroughly cleansed and an application of hartshorn made to it, in addition to energetic sucking to extract any irritating material which may have entered it. A prolonged study and considerable experience with regard to the subject have convinced me that the general practice of cauterizing dog-bites with nitrate of silver is dangerous and should be abandoned.

"Most medical men know that it is a foolish thing to kill a dog that has bitten anybody, soon after this has taken place. Such a dog should be caught and kept under the observation of a person of great carefulness, intelligence, and special information. The too speedy slaughter of a dog has robbed many a sufferer of the assurance that would have been gained by seeing it living and well, and has sent many a one to the grave, as dying of hydrophobia, who never had it, but had been bitten by a healthy and harmless animal.

"SPECIAL HEMORRHAGES.

"Bleeding from the nose, in children, is often nature's way of getting rid of an excess of blood; but it may be so profuse as to threaten life. If this be the case, salt-and-water or vinegar may be snuffed up the nose, injected by a fountain-syringe, or applied by pouring with the head thrown back. A strong solution of alum in very warm water is also useful; but vinegar is less disagreeable, and will seldom fail to check the bleeding. . . .

"In hemorrhage from the lungs the blood is bright red and generally frothy. It is rarely profuse, and yet, as it is usually

coughed up and caught in a handkerchief, it seems to be so. The amount can never be safely estimated in this way. The best treatment is rest in bed with the body raised in the sitting posture, and the swallowing of lumps of ice. The application of cold to the chest, if the patient is not too weak, is of some use, and a saltspoonful of salt and a teaspoonful of vinegar may be given every fifteen minutes. . . .

"In hemorrhage from the stomach the blood is usually very dark, looking like coffee-grounds. If it is mixed with any other contents of the stomach, its appearance may be masked. In such cases ice-water or broken ice may be swallowed, and teaspoonful doses of vinegar. Rest in bed must, and the application of cold to the stomach may, be employed, with tannic acid in five-grain doses.

"Hemorrhage from the bowels may be treated with ice-water injections and the application of ice to the abdomen. . . .

"In severe hemorrhage, rest in bed, without a pillow, and *with the head lower than the body*, must also be secured.

"POISONS.

"As it is better to prevent accidents than to correct them, it is a good plan to have dangerous articles kept invariably out of reach of children, and to have any bottle containing what may be dangerous marked by a ball and chain, such as the druggists sell, or by tying a stout piece of tape round its neck. This gives warning in the dark as well as in the light.

"When there is reason to believe that a child has taken a poison of some sort, it may be known what has been taken, or it may not be known. We will consider first

"*Unknown Poisons.*—If the child should vomit, this should be encouraged; if not, it must be provoked. The simplest way to do this is to give large draughts of lukewarm water, and to titillate the fauces. If there is time, and it is at hand, a teaspoonful or two of ground mustard may be stirred up in the water, or a teaspoonful of powdered ipecac, or a tablespoon-

ful of the syrup of ipecac. There is no occasion for fastidiousness. Any water will do. Water in which hands—or dishes, for that matter—have been washed may by its very repulsiveness act more quickly than anything else; and if soap has been used, it will be all the better for that, as soap is an antidote for acid poisons. The quantity used must be large; the sufferer must be urged to drink and drink, a large quantity at a time, until he can contain no more, and has been made to vomit over and over again.

"After copious vomiting, soothing liquids should be given,—oil, milk, beaten-up raw eggs,—all in moderately large quantities. These are especially valuable when the poison has been of an irritating character.

"If the sufferer be much depressed, some stimulant may be administered. Strong, hot tea, without milk, is the best, because it is a chemical antidote to many poisons. Strong coffee is next in value. To either of these can be added brandy, whiskey, wine, or alcohol, in half-teaspoonful doses, mixed with a little hot water. Warm coverings are not to be forgotten; and if the depression be great, hot-water cans or hot bricks, wrapped in one or two thicknesses of blanket, should be laid by the side of the chest, or a large poultice placed round the body, or a blanket wrung out of hot water and covered with a dry one.

"*Mineral Acids.*—For these the proper treatment is to give an alkali. A tablespoonful of hartshorn may be mixed with two teacupfuls of water and given; or almost unlimited quantities of soda, magnesia, potash, whitewash, chalk, tooth-powder, whiting, plaster, soap, or even wood-ashes, stirred up in water. After this should come the provoking of vomiting; then the bland fluids mentioned above should be administered, rest secured, and stimulation employed if necessary.

"*Oxalic Acid.*—For this the best antidote is lime in some form. If lime-water is at hand, it may be given freely, or whitewash, tooth-powder, chalk, whiting, or plaster from a wall. The latter may be crushed and stirred up in water,

without regard to the grittiness, which will not do any harm.

"*Carbolic acid* is a very dangerous poison, because it acts rapidly and benumbs the stomach, so that it is hard to provoke vomiting. This must be attempted, however, and large draughts of oil, white of egg, magnesia and water, or milk must be given. Rest, warmth of the body, and stimulation must also be secured.

"*Alkaline Poisons.*—Strong alkalies must be combated with an acid. Vinegar can always be had, and there is nothing better. It should be given undiluted and in large quantities. Lemon-juice may be used, or even orange-juice, though the latter is too mild an acid to be of much service, unless the oranges are very sour. Vomiting should then be provoked, and followed by bland drinks, rest, and stimulation if necessary.

"*Arsenic* usually excites vomiting and violent pain in the stomach. At once large quantities of milk, white of egg, flour-and-water, or oil and lime-water must be given. The vomiting must be encouraged or provoked, and dialyzed iron should be given freely, in tablespoonful doses, each dose being followed at once by a teaspoonful of common salt in a teacupful of water; or, if this is not at hand, equal parts of sulphate of iron and of carbonate of sodium may be dissolved in separate cups of hot water and then mixed and drunk. Afterwards vomiting should be again provoked, and followed by a dose of castor oil.

"*Acetate of lead* calls for vomiting, Epsom salt, milk, and castor oil.

"*Corrosive Sublimate.*—When this is taken vomiting must be provoked, and some form of tannic acid given. Strong tea is the handiest thing containing this, and its administration should be followed up with eggs and milk.

"*Tartar emetic* is best treated in the same way.

"*Phosphorus* is sometimes chewed off matches by children. It is a poison which acts slowly. Five-grain doses of sulphate of copper dissolved in water may be given, at intervals of ten

minutes, until vomiting comes on. Then a dose of magnesia should be administered, but *no oil.*

"*Nitrate of Silver.*—The antidote for lunar caustic is a very strong brine of salt-and-water, given again and again; and vomiting should be provoked until the vomited matters cease to have a look like thin milk.

"*Iodine*, in the form of a tincture, is also sometimes swallowed by mistake. The antidote for this is starch-and-water.

"*Opium preparations*, such as opium, morphine, laudanum, paregoric, black drop, must be combated with emetics, used promptly. Strong coffee must be freely given as a stimulant. So long as the breathing does not fall below ten to the minute, there is no *immediate* danger of death; but the important matter is to keep up the breathing. The custom of walking a patient up and down and slapping him with wet towels is to be deprecated, because it adds exhaustion to stupor. If an electrical battery can be obtained, the faradic current should be used, and applied so as to stimulate the sensory nerves in the skin, so that they shall excite reflex acts of deep breathing. The next best thing is to lay the patient upon a lounge and slap his skin with the back of a broad brush or with a slipper. This is all the rousing that is necessary, so long as the breathing keeps above ten to the minute. Should it fall below this, or if the breathing should cease, artificial respiration should be employed.

"*Chloral.*—The treatment for chloral poisoning is the same as for poisoning by opium.

"*Strychnine* poisoning should be treated by provoking vomiting, giving a purge, and doses of fifteen grains of bromide of potassium or ten grains of chloral, or both. The greatest quiet must be secured. The poisoned person should be put to bed in a darkened room, with doors, windows, and shutters arranged in a way that shall exclude all sights, sounds, and draughts, though permitting good ventilation.

"*Aconite.*—In case of aconite poisoning vomiting must be brought on, and followed by the administration of stimulants.

Strong coffee may be used, hartshorn (a teaspoonful in a teacupful of water), wine, whiskey, or brandy. If there is depression, warmth should be used, as described when speaking of unknown poisons.

"*Veratrum viride* poisoning is to be treated like aconite poisoning.

"*Hemlock, deadly nightshade*, the *Jamestown* (or *jimson*) *weed, monkshood, and toadstools* are sometimes eaten, without knowledge of their poisonous character. *Tobacco*, too, sometimes causes poisonous effects. All produce deep depression, and must be treated by the induction of vomiting, if it has not already occurred, followed by stimulation and warmth, very much as in the case of aconite poisoning.

"*Alcoholic liquors* are sometimes taken in such large quantities as to be poisonous. When this is the case the course to be pursued is to cause vomiting, give hartshorn-and-water (a teaspoonful in a teacupful), and keep the body warm.

"*Decayed meats or vegetables* usually excite vomiting, which should be encouraged till the stomach is empty, and followed by a dose of castor oil and some powdered charcoal.

"In conclusion, let it be remembered that when there is an alarm of poisoning it is important to *keep cool*. In many cases of poisoning there is much more alarm than danger. Death from accidental poisoning is very rare. To save time in an emergency, the following table may be consulted, which gives the name of each of the poisons we have already studied, and the proper treatment for it.

"POISON.	TREATMENT.
Unknown	Provoke repeated vomiting; Give bland liquids; Stimulate, if necessary.
Acids: Sulphuric, Nitric, Muriatic, Oxalic, Carbolic, ...	Give an alkali; Provoke vomiting; Give bland liquids; Secure rest; Stimulate, if necessary.

“Poison.	Treatment.
Alkalies: Hartshorn, Soda, Potash, Lye,	Give an acid (vinegar); Provoke vomiting; Give bland liquids; Secure rest; Stimulate, if necessary.
Arsenic: Paris green, Scheele's green,	Provoke vomiting; Give dialyzed iron and salt; } repeat several times; Give dose of castor oil; Secure rest; Stimulate, if necessary.
Acetate of Lead: Sugar of Lead,	Give Epsom salt; Provoke vomiting; } repeat several times; Give bland liquids; Give dose of castor oil.
Corrosive Sublimate, *Tartar Emetic,*	Provoke vomiting; Give strong tea, without milk; } repeat several times; Give raw eggs and milk; Give dose of castor oil; Stimulate, if necessary.
Phosphorus	Provoke vomiting; Give five-grain doses of sulphate of copper, or teaspoonful doses of turpentine; Give dose of magnesia, but *no* oil.
Nitrate of Silver	Give strong salt-and-water; Provoke vomiting; } repeat many times.
Iodine	Provoke vomiting; Give starch-and-water; Give bland fluids.
Opium: Morphine, Laudanum, Paregoric, etc., *Chloral,*	Provoke vomiting repeatedly; Give strong coffee, without milk; Keep up the breathing.
Strychnine	Provoke vomiting once or twice; Give a purgative; Secure absolute quiet.
Aconite, *Veratrum Viride,*	Provoke vomiting; Stimulate well; Keep head low.

"POISON.	TREATMENT.
Jamestown Weed, *Hemlock,* *Nightshade (belladonna),* *Toadstools,* *Tobacco,*	Provoke vomiting; Stimulate well.
Alcohol	Provoke vomiting; Give hartshorn-and-water.
Decayed Meat or Vegetables	Provoke vomiting; Give a purgative; Give powdered charcoal.

"*To provoke vomiting*, warm water may be used, with or without ground mustard (a teaspoonful to half a pint of water), or ipecacuanha (a teaspoonful of the powder or a tablespoonful or so of the syrup), and titillating the fauces. It is best to give large quantities (half a pint at a time) of warm water whenever vomiting is to be excited.

"*Bland liquids* are milk, raw eggs, some sort of oil, gruel, etc.

"*Stimulants* are tea, coffee, whiskey, wine, etc., or hartshorn-and-water. A teaspoonful of hartshorn in a teacupful of water will be enough for a dose. In making tea or coffee one must not wait to do it as if for the table, but mix hot water and the leaves or grounds, squeeze them well, stir together, and give the whole,—leaves, grounds, everything. At the same time, some may be made regularly, if there are conveniences for it.

"*Alkaline antidotes* are hartshorn-and-water (a tablespoonful in two teacupfuls of water), soap-and-water, lime, whiting, soda, chalk, tooth-powder, plaster, magnesia, whitewash, and even wood-ashes.

"*Acid antidotes* are vinegar and lemon-juice.

"In giving an antidote, never wait for it to dissolve. Just stir it up in any fluid at hand, except oil, and have it swallowed immediately."

CHAPTER XXXVIII.

FRESH AIR, VENTILATION, OUT-DOOR EXERCISE.

There is no more important subject for us to study than that of ventilation, by which we mean the getting rid of foul air and the entrance of pure air in as easy a manner as possible, free from draughts. We all know that cold air passing through a chink, and then striking against some sensitive nerve-point on the surface of the body, has a peculiar faculty of abstracting heat, or giving what is known as "a cold," affecting the mucous membranes. Of course, the more delicate or the younger the individual the more susceptible he will be to such an impression. There are certain parts of the body very susceptible to these currents of cold air; these are the face, neck, and feet; neuralgia, sore throats, and colds in the head being the consequence. But it is to be observed that these draughts are more apt to make themselves felt when the parts on which they strike are in a state of relaxation; naturally, should there be perspiration, its evaporation would intensify the cold impression. When children, then, after active play, and perspiring freely, sit in a room in a draught, they will take cold, while, on the other hand, they might continue their play in a colder room and not feel it; the action of their muscles, the excitement, giving them an immunity which they would not have in a state of quiescence. It should be our object, then, in the choice of a nursery, to have a room, or two rooms communicating (when speaking of these matters we specially refer to city houses), as far removed as possible from the contaminations and filth of the streets. The play-room should be large, should be situated in the second or third story, and should have the sunshine in it at least part of the day. A child's room should

have no communication whatever with a bath-room, water-closet, or stationary wash-stands. Children are peculiarly susceptible to the effects of sewer-gas, or sewer-air contaminated with germs, and many a case of diphtheria, or so-called membranous croup, has succumbed to the subtle influence of the poison of the disease, which has most insidiously been conveyed to the air of the room through traps that the plumber has pronounced absolutely safe. We have witnessed such distressing scenes in the houses—one might say palaces—of the wealthy, have seen such frightful cases of malignant diphtheria where money was no object in making the house perfect in all respects, but where, unfortunately, ignorance or avarice on the plumber's part allowed a deadly leakage of non-odorless sewer-air to go directly to a babe's room, that we feel we cannot say too much by way of caution.

Of course, for a few weeks the new-born babe will sleep with its mother; if it is a strong and vigorous child it may be put in a crib or bassinet by her side. The great objection to placing the child away from the mother is that, after the nurse leaves, she will have to reach for it, and if her room is cooler at night, as it should always be, there will be great danger of her taking cold when she nurses the baby. On this account, the child's crib should be placed as near as possible to the mother's bed, or she should allow it to sleep in the bed with her, but so placed that it will have a portion of the bed entirely to itself. The child is, certainly, after a couple of months, healthier when sleeping alone.

For the first month, at least, after birth, while the nurse is still with the mother, she should take charge of the infant and bring it in to nurse at the proper hour. The choice of a nursery and sleeping-apartment is a matter of great importance. The essentials are purity of atmosphere, uniformity of temperature, and freedom from dust and gases which may arise from methods of heating; especially is this the case with faulty hot-air furnaces. There should be plenty of sunshine when possible. At the present day, with our extended knowl-

edge of the causes of disease, impurity in the atmosphere has assumed great importance; we are now able to recognize the fact that certain diseases which were hitherto attributed to cold, are in reality due to filth; that certain other intestinal disturbances which were attributed to heat, are in reality due to decomposed or fermented food and to bad milk. These facts are most important to bear in mind, not only to enable us to cure disease, but also because, by a thorough recognition of them, diseases or disorders which have been attributed to climacteric disturbances, may, by the timely institution of hygienic measures, be avoided. There is no reason why a child that has a well-ventilated, clean, bright nursery, whose milk is watched with zealous care and never allowed to become tainted, one who is daily bathed, not overfed, neither debilitated by too heavy clothing nor subjected to daily fluctuations in bodily temperature, should not pass through the summer season in a city unharmed by the so much dreaded summer weather. We mention this because, probably, many mothers who read this book cannot afford to spend the summers out of town.

A nursery should always have an open fireplace for ventilation, and a counter-opening should be made over the window, so as to allow the air to be changed with the least draught possible; this can be done by pulling down the top sash and inserting a four-inch strip of board to keep it down; by this means an indirect current will be made between the sashes. Of all the methods of heating, probably the most used, but, unfortunately, the one that can be most abused, is the hot-air furnace. Parents should see that their nurseries are supplied with air that is, first of all, pure: it must be taken at as great a distance as possible from the ground, and not immediately off gutters and damp yards, as is very frequently the case. The air most charged with atmospheric impurities, whether they be germs or gases, is that which is usually heated and sent to the nursery; the heating simply making it more poisonous than before. The heated air should be passed over a

surface of pure water, by which means it will receive a certain amount of moisture, and should then be carried, as free from dust as possible, directly to the nursery. Air which is not passed over water, but simply dried, will undoubtedly produce various forms of irritation of the mucous membranes, dryness of the throat and nose, languor,—symptoms which we all recognize at once. Certainly nothing can be better than an open grate, with a wood fire, even if it be only occasionally used, to supplement the furnace, especially at night; but we much prefer a system of hot water and indirect radiation for the heating of houses in our changeable climate.

We have always insisted that either an earthen water-vessel which comes for the purpose be filled with water and placed in front of the "register" in the nursery, or else a basin of water with a towel dipped into it, the upper corner of the towel being pinned above the register. In a sick-room the water can be medicated, if necessary.

The sleeping-room should be heated through the nursery, if possible, and should be occupied only at night. Of course, these matters are difficult to control, but at the same time, if parents know what ought to be done and take an interest in the matter,—think for themselves,—many arrangements can be made to overcome temporary difficulties which at first seem insurmountable, and thus render a dreary, unhealthy nursery healthful and habitable. The nursery should always have a thermometer, and the temperature should be kept at about 68° or 70° F. The heat should be always shut off at night, and the bedclothing so arranged as to prevent its being thrown off while the child is perspiring during the early morning hours, when the system is most depressed, and at which time the danger of catching cold is most imminent. For an infant, the sleeping-room should be kept as much as possible at the same temperature day and night. Avoid all sewerage arrangements —pipes of every kind—in a nursery. The science of ventilation and house-drainage gives us probably as perfect a system

as we shall ever have, but, unfortunately, the slightest fault of construction will turn the otherwise harmless contrivance for our comfort into one of the most deadly; and there is no means by which we can detect the presence of the sewer-air that serves as a carrier of the poison of diphtheria or typhoid fever, any more than there is evidence of the existence of their germs in drinking-water. The most costly habitations of the wealthy have these dreaded diseases carried into their midst to a greater extent even than is found among the poor. The classes of persons who suffer most from diphtheria are the very wealthy and the very poor. Those of moderate wealth guard their children carefully against cold, in the first place, and their limited means prevent them from having those luxuries by means of which the deadly sewer-air is carried into their bedrooms. Physicians believe that diphtheria most frequently requires a cold, a catarrh in the throat, before the poison is thoroughly absorbed, and probably this accounts for the resistance which is observed in so many cases to an attack in the summer. Just as soon as the child takes cold, becomes a little run down, that dreaded disease will show itself.

The drinking-water should be pure; when there is the *least doubt* about its purity it should be *boiled*. We think every household would be safer in having a Pasteur filter. "A stitch in time saves nine;" a little expense and trouble may save a loved one from death by typhoid or diphtheria. It should also be remembered that ice is a great carrier of diseased germs; in fact, that the freezing process merely benumbs them to render them as virulent as ever when thawed. If possible, only artificially-made ice should be used, and if it cannot be obtained, the strictest care should be taken that natural ice, from however pure a source, should not come in contact with the infant's food. With the Pasteur filter comes a "cooler" by which the water can be cooled. Iced water is not healthy for children; water should be cool, not cold.

We have laid great stress on the importance of thorough ventilation and fresh air, but we wish it distinctly under-

stood that constancy in the purity of air, both day and night, is not only requisite in the nursery, but also in the sick-room. Cold air is not necessarily pure air, nor is air which is warmed made impure by warming; at the same time it should be remembered that air filled with germs of disease, warmed by a "heater," may become most deadly when carried to the sleeping-chamber. A child's vitality is lowered at night, its circulation is slower, its resistance to disease is less. A person sleeping and chilled is much more liable to take cold than one who is awake; especially is this so in childhood and old age; but the temperature of the sleeping-room may be reduced at night (the heat being turned off), with benefit, if the child is covered—not enough to induce perspiration—and the clothing so arranged as not to be thrown off. Of course, a child, up to at least six months, should be kept in a room which has as nearly as possible the same temperature day and night, as it sleeps most of the time, and when taken out of doors is so warmly clad that the change of air cannot affect it.

To sum up, then, a nursery, or child's living-room and bedroom, should be kept scrupulously clean, thoroughly aired, and should be free from dust; dust, independently of its irritating character upon the mucous membrane, is the means of conveying disease. The room should be swept with a patent sweeper, and the dust which has accumulated should be carefully wiped off the places of its lodgement by means of a damp cloth. The ideal nursery floor is one of hard wood, well laid and polished, with rounded corners, and covered with a rug, which should be shaken frequently. There are many days in our treacherous climate when a child cannot be taken out of doors; indeed, there are many days when it had better remain in its well-aired nursery,—days during which, if it went out of doors in its perambulator, it would inhale the exhalations from the foul masses that accumulate in our city streets. A child in arms is far safer when carried out of doors for fresh air than is one in a perambulator upon its first going out.

The day nursery should be supplied with plants. They are

undoubtedly beneficial to health when properly cared for, and make the living-room bright and cheerful, and this reacts on the disposition of the child. A bright, happy home makes a bright, happy child, and what is freqently taken for temper, perverseness, in many children is often sickness and unhappiness. Happiness tends to health, and health is greatly dependent on happiness. A child, from its infancy, that can take a "no" from its parents as an ultimatum is far happier than one who constantly frets for the purpose of having its whims gratified. The parent who forbids the child five times and then relents establishes a precedent that will invariably give rise to trouble in the future. A command should always be observed, a "no" should always be a "no," and such a bringing up will help the doctor in case of illness—save life, perhaps—and make the child a blessing in the house and a delight to all who come in contact with it. An unhappy time indeed has the doctor who is called to attend a child in illness who has been accustomed to say, "I won't" or "I will." Those who are much thrown among children recognize this fact; indeed, it is one which every grown person feels when he or she looks back to childhood days. The energy and buoyancy which comes with good health is in marked contrast to the depression and irritability that is associated with illness, or, if not exactly illness, with those sedentary pursuits that are in themselves unhealthful.

In an excellent article on "Nursery Hygiene,"[1] Dr. L. M. Yale says,—

"In selecting a room for a nursery, that should be chosen which is the sunniest, best aired, and driest; and in deciding between two or more houses in other respects equally eligible, distinct preference should be given to that one admitting of the best arrangements for nursery purposes. In houses where no room is to be specifically set apart as a nursery, and children are to occupy the general living-room by day and the

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[1] Keating's Cyclopædia of the Diseases of Children, vol. i.

parents' bedroom by night, the same rules should govern the selection of these rooms, the sanitary benefit in such case accruing to adults and children alike. When the nursery is separate it is preferably to be placed above the ground-floor, unless the latter be unusually well raised from the ground, but it should not be immediately under a roof, on account of the difficulty of regulating the temperature in such a situation.

"The beneficial influence of sunlight needs no insisting upon; nevertheless it is constantly overlooked. The nursery should, if possible, look to the south, or as nearly so as the situation of the house permits, with a morning exposure in preference to an afternoon sun, if but one can be had. The windows should be ample in size, and more than one if possible, as they not only serve for the admission of light, but in the ordinary dwelling are the only avenues of ventilation. The sensibility to the loss of sunlight seems to vary somewhat with adult individuals, but we believe that all children suffer from its absence; and the physician should insist upon the daily complete sunning of the apartment. In summer, even, it is usually better to have the sun and to mitigate its power at proper times by means of awnings and blinds than to have a room upon which it does not shine. There may be circumstances of climate or of prevailing winds which will modify this rule, but it holds in general. The room should be of ample size, particularly if it serve, as is the rule in ordinary houses, the double purpose of night and day nursery. The precise amount of space required for each child will vary with the arrangements for ventilation, but not less than fifteen hundred cubic feet of air per hour should be allowed, and preferably double that amount.

"As only in the houses of the wealthy can a room be specially set apart as a sick-bay or hospital, the nursery must ordinarily serve that purpose whenever illness occurs. For this reason, as well as for others, the furnishing of a nursery should be as simple and as easy of cleansing as is consistent with comfort.

The floor should be of smooth, closely-joined boards, preferably of hard, close-grained wood. The seams, if they open by shrinkage, should be closed either by relaying or by calking well done. Poor calking is worse than useless, and any calking is inconvenient in rooms the floors of which must be raised to reach gas- or water-pipes, as is unfortunately often the case. Carpets are necessary to comfort, but movable carpets or rugs are far preferable, as permitting more frequent cleansing both of the carpet and floor. At the present time even cheap grades of carpets are made in rug form, or the desired pattern can be made up with tasty borders without much expense. In case of actual illness of a contagious nature the rugs may be taken away at once, and their contamination be prevented, which in view of the difficulty of subsequent disinfection is very desirable. The same precaution against dangerous dirt leads to the preferring of painted and varnished to papered walls for the nursery, even at the loss of some beauty in the apartment. If paper is strongly insisted on, it should be of a kind that can be thoroughly varnished and will admit of being washed, and all old paper must be first removed before new is laid. The furniture of the room should be as light as consistent with serviceability, in order that the pieces may be easily moved from place to place to admit of frequent cleansing; and for the same reason, every bulky or heavy article should have large and strong casters. It is further desirable that all furniture should be as plain and simple as possible, carved wood and thick upholstery stuffs being objectionable as receptacles for dust. Taste may be gratified without violating this requirement. Further, all cupboards, closets, and similar places of deposit should be as open to inspection as possible, in order that offensive or untidy things may easily be detected and removed. On account of this facility of examination and cleansing, the writer usually prefers shelves with a removable curtain in front to closed cupboards and deep drawers. The latter are suitable enough for clean linen, but are temptations to careless attendants to indulge in 'tuck-away neatness.'

"*Warming and ventilation* can only be touched upon in this article. If the nursery is in a house with a good system of heating and ventilating, nothing in particular will be needed except a grate or a stove for use in emergencies. Ordinarily, however, even houses which have a fairly good furnace or other heating-apparatus have no specific arrangements for ventilation beyond what are afforded by the windows, chimneys, and imperfections of structure. The ordinary methods of warming in use in this country are open fires, stoves, and hot-air furnaces. The hot-air furnace, if properly constructed, is quite satisfactory. Its commonest faults are the delivery of too small a quantity of air at too high a temperature (a larger quantity at a lower temperature being preferable), and such an arrangement of its cold-air flue that the supply is from an impure source. The former difficulty is overcome by having the furnace considerably larger than necessary and by keeping the fire moderate; the latter, by using a tight metal flue the outer end of which is free from unwholesome surrounding and preferably raised some feet from the ground, by which means some of the foul air of dark city back-yards or of the gutters is avoided. The same precaution is of use in many country houses. The outer end must be protected by a wire screen, to prevent mischief being done by children or small animals. If the screen be fine-textured it will diminish the amount of dust drawn into the house. For a nursery it is of advantage to have the registers for warm air rather high, as this arrangement makes a better general circulation of air, diminishes the intensity of floor-draughts, and renders meddling with the register by small children more difficult.

"The open fireplace has for advantages cheerfulness of aspect and a fair amount of ventilating-power, for disadvantages great wastefulness of fuel in proportion to its heating-power, so that ordinarily, when this is the only source of heat, great differences of temperature exist in different parts of the room; if the neighborhood of the fire is comfortable, the remoter parts are cold. Further, it ventilates by the production of

draughts, particularly of floor-draughts, which are especially dangerous in the nursery, where little children spend so much of their time upon the floor. The wood fire is very beautiful and useful when a short, quick heat is needed, but, aside from its costliness, it is not so good for steady heating as a coal fire. In the nursery any open fire must be carefully guarded by a strong wire screen, to prevent accidents from sparks or from the clothing of children taking fire. Stoves of the ordinary close varieties, the 'air-tights,' are very economical of fuel, but nearly useless as ventilators, and if used make especial watchfulness as to ventilation necessary. The ventilating stoves which are the offspring of the old 'Franklin' make a compromise by which all the ventilating value of the open grate is preserved with far less waste of fuel, about three times as much of the heat-value of a given amount of fuel being utilized by these stoves as by the open fire. The principle of construction in its simplicity is to surround the stove and its smoke-flue for some distance with an air-chamber; to this chamber air is admitted, preferably from out of doors, and as it is warmed it is poured into the room at a higher point,—for instance, near the mantel. As regards all stoves, it is perhaps safer to have no damper in the smoke-flue, or else to fasten it so that it cannot be closed without difficulty, since by so doing the danger of the gases of combustion being forced into the room is removed.

"Ventilation, in a house which has been constructed with no reference to it, usually must be accomplished by simple devices or not at all; any radical improvements would be practical reconstruction. The most natural thing to do to let in fresh air and let out foul is to open a window; but this of course in cold weather involves dangerous draughts. We cannot, with our fickle and often severe climate, even do as some English writers suggest should be done,—fasten the upper sash so that it cannot be quite closed. Window-ventilation, therefore, must in winter be carried on by means of some contrivance which will break the force of the current of air and direct it upward

so that it may be diffused about the room. The 'elbow-tube' ventilator placed under the lower sash is well known; so are various wire screens, either vertical or rotating like at ransom. A very useful one, and the simplest and cheapest, is the common window-board, which, fitting against the inside of the lower sash, allows the latter to be raised and the current of air inward is sent directly upward at the overlapping of the two sashes. The board should be at least eight inches high. The plan of a stout cloth nailed across the lower part of the window allows, when the sash is raised, two currents, one above and one below. The writer thinks he gets the same advantages by modifying the window-board as in the figure. The strip B runs the whole length of the board. If it is desired to shut off the lower current, the sash is left in contact with the strip; if the lower current is desired, it is left below the strip, as at A.

Fig. 34.

"The stove with jacket used in barracks seems to be well adapted for nursery use. The stove is surrounded by a jacket of sheet zinc or iron, with necessary doors, leaving space between the stove and the jacket. This should come to the floor, and the cold air be brought from out of doors to within the jacket by means of a small pipe; the air escapes warmed at the top of the jacket. For the nursery the jacket has the advantage of being a safeguard against burns, at least against severe ones.

"The getting of foul air out is a rather more difficult problem, especially with stove heat. An open window with the double current described will do fairly well under favorable circumstances, but is rarely sufficient when an air-tight stove is used.

If in the construction of chimneys a ventilating-flue is included, or if the smoke-flue is enclosed in a space which may serve as a ventilation-flue (as, for instance, a stove-pipe running up within a chimney which has a fireplace at the bottom), it is easy to ventilate a room. If the chimneys are already closed in, the cheapest and at the same time an efficient method is to have an air-flue leading from near the floor into the chimney higher up. The upward current of air in the latter draws the air through the ventilating-shaft. It is more efficient if placed near the stove, so that the air within it is heated and its upward movement hastened. Its mouth is placed low, to save unnecessary waste of warm air.

"It should be remembered that the artificial light of lamps or gas in a room rapidly spoils air for breathing. Lighting-capacity is usually measured in candles, and an average adult produces rather less than twice as much carbonic acid as one candle: as a consequence, a large kerosene lamp or gas-burner often equals the production of five or six adults. It is very desirable, therefore, if a night-light is necessary in the nursery, that its carbonic acid be got rid of; and by the device, often used for ventilating purposes, of putting the burner or lamp within or beneath a tube or flue going to the roof or chimney, the results of combustion are carried away and an outward current of small power is also established. By having at the bottom of the flue a box, with a door, to contain the light, the latter may be shut off partly or wholly except when needed.

"As to the temperature of the nursery authorities are not quite agreed; but it is certain that in American cities it is usually too high, in common with that of the rest of the house. Children and adults are often forced to endure in winter apparel a temperature (70° F. and upward) which in summer is considered to demand much lighter dress. There are good reasons why the standard of house-temperature is usually set high in America, but it is carried too far. The discrepancy between in-door and out-door temperature is made too great, the skin and mucous membranes are made sensitive, and the multitudi-

nous forms of 'colds' favored. We believe that if a room can be uniformly heated, 65° F. will be found, on the whole, more comfortable and healthful than the usual 70° F., which latter should not be exceeded. Where intelligent supervision of the temperature can be relied upon, we believe that a still lower degree than 65° F. will be healthful to children old enough to play about. At night the temperature should not be allowed to fall too far below the day standard; and especial pains should be taken to guard against the uncovering of children in bed.

"A word should be added concerning windows. As is well known, the loss of heat from the cold glass is very great: Mr. Hood puts it that by each square foot of glass more than one and one-quarter cubic feet of air (1.279 cu. ft.) will be lowered each minute as many degrees as the difference between the internal and external temperatures. If, for instance, the thermometer outside showed no colder than freezing temperature, 32° F., and within no higher than 67° F., the discrepancy would be still 35° F. A window three feet by six feet would expose eighteen feet of glass surface, and according to this rule it would cool each minute ($18 \times 35 \times 1.279 =$) 805 + cubic feet one degree, or about two hundred cubic feet four degrees. This makes a constant current of descending cold air near a window very sensibly felt by any one obliged to work in such a place in cold weather. It is important, then, that children should not play immediately near a window in cold weather, and a low article of furniture may be often so placed as to keep them away without the trouble of constant oversight. The ingenuity of the attendant will similarly devise means of keeping them from sitting on the floor if it be draughty.

"Besides the admission of pure air and the discharge of foul air, purity of atmosphere demands that no nursery nuisances be allowed to exist. It is better that no plumbing of any sort should be in the room itself. Bath and closet conveniences are very necessary, but should be a little removed and well venti-

lated. In houses that are not plumbed, a place to which all offensive or soiled articles can be directly removed should be provided, which place should have free ventilation. In especial all soiled napkins and vessels containing evacuations or urine should be promptly removed, and in case of sickness a vessel should be provided in which the napkins or stools can be disinfected.

"Under ordinary circumstances, however, disinfectants, in the usual sense of the word, have no place in the nursery nor in hygiene generally. A place that cannot be made wholesome by sunlight, air, and cleanliness should not be occupied. Whenever emergencies demand their use, they should be of the safest kinds consistent with efficiency, and after a contagious illness only the more costly contents of the nursery should be disinfected; the cheaper ones can be burnt with greater ultimate economy. For this reason we always urge that toys be of the cheapest description, particularly if of such a kind as readily to conceal supposed sources of contagion. The painting of walls and ceilings and the closely-laid floor already urged are of great assistance in promoting efficiency of disinfection. . . .

"The care of the *hair* consists in infancy chiefly in the care of the scalp, which must be kept strictly clean. If the vernix caseosa is as completely removed from the scalp at birth as from other parts of the person, there is usually little difficulty in preventing future accumulations. A soft brush should be frequently used upon the hair, a comb only as a separator for parting the locks and in emergency for disentangling.

"The *teeth* require the same care as in adult life, but brushing should be of the gentlest sort, for fear of irritation of the gums, which may cause their subsequent retraction. In infancy after each feeding or nursing the gums should be washed, to prevent the formation of aphthous growths, and the teeth treated likewise as they appear. When the child is old enough to be quiet while the cleansing is done, a soft badger-hair tooth-brush should be used.

"*Dress.*—The hygienic essentials of dress are—sufficient warmth without burdensomeness, uniformity of protection as far as consistent with activity, freedom, and, for children at least, softness. The problem of warmth without undue weight is best solved by the use of woollen garments. By reason of the poor conducting power of wool, such garments retain the bodily heat longer than those made of other materials. This slowness of conduction is greater in loose-textured fabrics. That is to say, a given weight of wool is warmer if loosely than if tightly woven. Hence the warmth of knitted garments. The difference is due to the retention in the interstices of a certain amount of air, which is a poor conductor. For the same reason, two garments, two shirts for instance, are warmer than one shirt of weight equal to the two, and loose-fitting garments are warmer than tight ones. In hot weather, however, tight garments are distressing for other reasons. Linen stands at the other extreme of ordinary dress-materials, being the best conductor of heat. It follows that woollen garments give the best protection against change of temperature and chilling, and in proper weight they make the safest dress in all places where temperature may vary or for all children who may become heated in play. Fashion or taste usually calls for outer garments of linen, but the protective garments should be beneath. The absorption of heat from the sun varies very much according to the color of the garment, the material and texture being unchanged, white taking the least heat, or being the coolest, while black will absorb about twice as much. Singularly enough, the 'cool-looking' light blue is found by some experiments to be very nearly as hot as black. For very young children who are little exposed to the sun's heat this question of color is of minor importance.

"Softness of material is essential for children on account of the sensitiveness of their skins. To most infants fine soft woollen shirts, either knitted or of 'baby flannel,' are seemingly entirely comfortable. Some, however, manifest unusual irritability of skin, and for such a shirt of fine linen should be

placed within the flannel. This precaution is more often necessary in hot weather, when the flow of perspiration is increased.

"The ordinary dress of very young children is objectionable in several ways. It is ordinarily unnecessarily confining about the body and limbs, although it has never in this country reached the degree in this respect that seems to be usual in some Continental countries. There is also an unnecessary number of layers of fabric involved, as they are not required for the child's warmth under ordinary circumstances. The process of dressing or undressing is really an ordeal to the infant, as it is alternately rolled upon its back and belly in the nurse's lap, in order that one band after another shall be fastened by pins or stitches. Very much of this dressing is unnecessary, if not harmful. First of all is the 'band,' a girdle enveloping the trunk from about the nipples to the iliac crest. Such an appliance may possibly be useful during the healing of the navel; afterwards it is not of use if tight. The abdomen needs no support in health, the compression of the ribs is not advantageous, and so far as such a girdle affects the question of hernia (which it is popularly supposed to prevent) at all, it rather favors the production of the inguinal or femoral variety. A loose girdle worn to prevent chilling is, however, often advisable in hot weather; and in cold weather a flannel girdle, or binder, 'cut bias' to secure elasticity, makes a useful envelope for the entire trunk of very young children as a preventive of bronchitis.

"As a means of getting rid of the objectionable features of the ordinary dress, the writer has for some years recommended the following plan[1] or some modification of it. There are three garments (besides the napkins), all covering the neck and shoulders and reaching ten or twelve inches below the feet. The outer garment, as well as the middle one, is a little

[1] "This plan was originally devised by Dr. Grosvenor, of Chicago, for use in his own family, and subsequently published by him.

larger in every dimension than that beneath it, so that no binding shall take place. They are all cut in the girdle-less pattern called 'Princess.' The inner one has sleeves, and may be made of cotton flannel or very soft wool flannel; if wool is used, care must be taken against shrinkage in washing. The next garment has no sleeves, and no seams at the arm-holes, to insure against pressure there; the material is wool flannel. The outer one is the usual dress, with high neck and sleeves, the details of which may be modified to suit taste. Thus, except the sleeves, the thickness is the same throughout. At night a garment like the inner one above described and a napkin only are worn. These three garments are placed one within the other before the dressing commences, pains being taken to avoid wrinkles and folds, and they are put upon the child as one garment with very little trouble. They are removed with equal ease.

"The napkins may be of any suitable kind,—*i.e.*, soft and absorbent material, easily washed. Linen has no real advantage ordinarily over cotton, except æsthetically. Old linen is soft, but likely to be thin. It is desirable to diminish the bulk of the napkins as far as possible, to prevent uncomfortable pressure: this is accomplished by having a small napkin simply to cover the seat and genitals thick enough to retain the urine or fæces, covered by another one not thick, but large enough to envelop the hips. The age at which napkins may be discontinued depends upon circumstances. Among English families of the better classes, apparently, children are taught to make their needs known earlier than is usual with us. Much can be done by an attentive and intelligent nurse who holds the child over a vessel with suitable frequency. But children vary greatly in this particular, and under no circumstances is any severity justified, or even scolding, as nervousness or anxiety on the part of the child simply aggravates the trouble. As soon as the child can regularly give notice of its wants in this respect it is better to discontinue the diaper, as its absence gives greater freedom to the limbs.

Of course at all times napkins should be changed as soon as discovered to be damp or soiled. Rubber or other impervious covers for diapers should not be used. Even the exigencies of a railway-journey, with the conveniences usual in this country, do not require their employment. They simply convert a wet napkin into an unclean fomentation.

"When a child begins to use its limbs freely, the clothing should be shortened. In fact, there is no real need of long clothes at any time, except to save labor in keeping the infant's feet covered. When it begins to creep, its manœuvres are facilitated by slipping over its skirts a loose baggy pair of breeches of woollen which is tied around its waist and buttoned about its knees. This keeps the skirts from impeding its progress, and protects it against floor-draughts in a measure.

"The dress of older children should conform to the same hygienic requirements as given above. The two most frequently disregarded are freedom from constriction and uniformity of protection. The former is violated by the use of tight girdles, or even by corsets, tight sleeves, garters, and misshapen stockings and shoes. Their harmfulness is well understood: the neglect is usually a wilful preference of fashion to healthfulness. The same might perhaps be said of the fashion of unevenly distributing the clothing over the person; but the injurious effects of this are less understood. Chilling is resisted far better if the whole person is exposed to the same temperature than if one part is exposed to a lower temperature than another. It is a matter of universal experience that many persons who rejoice in out-door life even in severe weather are directly injured by a draught and by sitting near a window. Yet formerly more than now low-necked dresses were used for children, the entire shoulders being exposed, while the remainder of the trunk was burdened with dress. At the present time fashion exposes the legs more. Shoes and stockings are often too thin, but in particular children are too often dressed with the lower limbs

bare from above the knee to a little way above the ankle, the foot being covered by a slipper. The difference is often aggravated by too much clothing on the body and a sash over all. The lower limbs should be thoroughly clad,—not cumbrously, but warmly. The stocking of a child old enough to run about should be long enough to meet or be overlapped by the next article, napkin or drawers, as the case may be. Stockings of wool, for the reasons already given, are to be preferred. They should be soft. They should not be pointed at the toes, but be wide enough to admit of ample play in every direction of the anterior part of the foot. Color is not indifferent, as some dyes have been found to produce eruptions on the skin. Public attention has, however, been so thoroughly drawn to this subject as to have led in some instances to legislative enactments, and such dyes are probably less frequently used than formerly. Aniline reds have been thought to be especially irritating.

"Shoes of proper shape are not easy to get for children; not nearly so easy as for adults. This comes probably partly from the supposed necessity of making them for a low price and partly from a belief, often openly expressed, that 'a baby's foot has no shape.' The real shape of the human foot is followed in the true 'waukenphast' shoe, but this we have never seen of proper sizes for infants or young children. It is not enough that a shoe should be as wide or wider than the foot, but it should have its width rightly disposed: space where the foot does not demand it in no wise compensates for pressure elsewhere. The result must inevitably be a distortion. In choosing shoes for infants it is better that they should be unduly long, if that be necessary to obtain the requisite width in front, than that they should be narrow."

The following, taken from Miss A. M. Bacon's fascinating book on "Japanese Girls and Women," will be of interest. Writing of the Japanese baby, she says, "It is not jolted, rocked, or tossed to sleep; it is allowed to cry, if it chooses, without anybody supposing that the world will come to an end because

of the crying; and its dress is loose and easily put on, so that very little time is spent in the tiresome process of dressing and undressing, . . . and it is not subject to fits of hysterical or passionate crying, brought on by much jolting or tossing, or by the wearisome process of pinning, buttoning, tying of strings, and thrusting of arms into tight sleeves.

"The Japanese baby's dress, though not as pretty as that of our babies, is in many ways much more sensible. It consists of as many wide-sleeved, straight, silk, cotton, or flannel garments as the season of the year may require,—all cut after exactly the same pattern, and that pattern the same in shape as the grown-up *kimono*. These garments are fitted one inside of the other before they are put on, then they are laid down on the floor and the baby is laid into them; a soft belt, attached to the outer garment or dress, is tied around the waist, and the baby is dressed without a shriek or a wail. as simply and easily as possible. The baby's dresses, like those of our babies, are made long enough to cover the little bare feet, and the sleeves cover the hands as well, so preventing the unmerciful scratching that most babies give the face, as well as keeping the hands warm and dry." Would that some bold and brave mothers would make fashionable such baby-dressing in this country!

By way of contrast we will quote the following:

Dr. W. Thornton Parker, writing of American Indian women, says, "As soon as the Indian baby is born it is placed in a coffin-shaped receptacle, where it passes nearly the whole of the first year of its existence, being taken out only once or twice a day for washing or change of clothing. This clothing is of the most primitive character, the baby being simply swaddled in a dressed deerskin or piece of thick cotton cloth, which envelops the whole body below the neck. The outside of the cradle varies with the wealth or taste of the mother, scarcely two being exactly alike. Some are elaborately ornamented with furs, feathers, and bead-work, others are perfectly plain. Whatever the outside, the cases

themselves are nearly the same. A piece of dried buffalo hide is cut into proper shape, then turned on itself, and the front fastened to a board or, in the most approved cradles, to two narrow pieces of board joined in the form of an X.

"It forms a real 'nest of comfort,' and, as the Indians are not sticklers on the score of cleanliness, it is the very best cradle that they could adopt. To the board or boards is attached a strap, which, forced over the head, rests on the mother's chest and shoulders, leaving the arms free.

"When about the lodge the mother stands the cradle in some out-of-the-way corner, or in fine weather against a tree; or if the wind is blowing fresh it is hung to a branch, where it fulfils all the promise of the nursery rhyme. When the baby is ten months old it is released from its confinement and for a year or two more of its life takes its short journeys on its mother's back in a simple way."

The question is often asked, at what age a child should go out of doors, and whether it should go out every day, notwithstanding the weather. It makes a very great difference whether the parents live in the country or the city. Country children, of course, are out most of the time, as they grow older especially; whereas, in the city, the impossibility of thus turning them loose and the necessity of a nurse to accompany them are matters that have to be taken into consideration. After a babe is about six weeks or two months old, if the weather be at all moderate, the nurse can wrap the child well and take it in her arms out for a walk. There is less risk of young children taking cold than older ones, from the fact that they are much easier wrapped and kept warm, and the nurse is able to carry them. At the same time, if the house is well ventilated and warm and the weather cold and changeable,—dirty streets, snow, and dampness rising from the ground,—it is far better for the child to remain in the house. As soon as a child arrives at the age when it is a drag upon the nurse, is difficult to carry, and at the same time cannot walk, and a perambulator is required, the time to exer-

cise the most judgment has come. Any mother can see this for herself by going to one of our city parks and watching the congregation of nurse-girls there assembled, noting the position of the baby carriages and the condition of their occupants. A child will be left facing the bleakest March wind, or the midsummer sun fiercely attacking its unprotected head, while the nurse is engaged in conversation with a number of her friends. We have often been at a loss to understand how mothers could select these young, inexperienced creatures to take care of their children, knowing full well what would be the consequences, and then be surprised if the child should be taken with a severe sore throat, earache, pneumonia, or inflammation of the brain. It would be far better if all children, until they are old enough to sit up by themselves, were carried by their nurses on their every-day outing, and that after a child is too big to carry, and too young to walk, it should sit up in its carriage, well wrapped, then the nurse take a long walk, with the distinct understanding that under no circumstances is the carriage to be stopped; when she is tired she is to come home. We are very particular in laying stress upon this matter, because, notwithstanding all that has been written on the subject and the full knowledge that mothers obtain from their family physicians, who are one and all opposed to the present system and acknowledge that a larger part of the diseases of children is due, undoubtedly, to the carelessness, in one way or another, of their nurses,—these girls, without any experience whatever, with no judgment, certainly no affection for their charges, are hired and intrusted with the care of an infant, and are allowed to take it out, going where they will, to carry it into heated rooms, to leave its out-door wraps on, to carry it out of doors while it is perspiring, and to expose it to contagion of every kind, taking it into all sorts of atmospheres; and yet, after the child has been returned, its fond mother will fondle and caress it, guard it against the least exposure, treat it as the tenderest flower, and be struck with wonder and surprise when it is taken ill. So important

do we deem it that a child's nurse should be selected with the greatest possible care, that she should be a woman chosen on account of her experience, conscientiousness, and truthfulness, that we believe the mortality from contagious diseases, and from those disorders due to direct exposure, would be diminished if mothers could be made to appreciate this matter.

CHAPTER XXXIX.

BATHING.

The child should be gently washed in warm water with a soft sponge, or soft linen, with Pears' non-scented or with Castile soap, and care should be taken that every part of the body be carefully washed, so as to free it from any impurities that cause irritation to the tender skin; the nostrils, the eyes, the mouth, the various crevices of the groin, the armpits, and the genitals should be thoroughly cleansed.

There should be a thermometer in the nursery, and the child's bath should be always regulated by it. The temperature of the water should be such as to give a sense of gentle warmth to the hand, and as the child grows older and becomes strong, the circulation well established, the temperature should be gradually reduced until it is about 75° F., or cooler. It is not at all necessary that a child should receive a full bath twice a day; once a day is amply sufficient,—in the morning. A child should always delight in its bath; when it is old enough to have its tub, the bathing should be made a pleasure to it. Give it something to play with in the water; make a frolic of it. Should it at first dread the bath, be careful not to frighten it; place a blanket over the water and let the child gradually become surrounded by water by immersing it with the blanket. Always wet the head first, even with babes. At bedtime a

sponging off will be enough, unless the child possesses one of those excitable dispositions to which we have already alluded, —is the child of intellectual parents, those who depend upon their brains for a livelihood: these children always exhibit a more or less nervous, irritable disposition, which renders them at times restless and sleepless. For such, the sedative effect of a bath at night is most marked; indeed, for these it is well to usually sponge off with cool water in the morning, and leave the bath for the night, making the water about blood-heat in order to get its full sedative influence.

It is a very great mistake to accustom a child to bromide, valerianate of ammonia, brandy, or gin, to make it sleep; *these should never be used without the consent of a physician;* but the sedative influence of a warm bath, or warm foot-bath, can never be harmful. The usual time for giving the morning bath is about nine or ten o'clock; at this time digestion is not going on, as a rule, and the child can be thoroughly washed, the surface being brought to a glow either with the hand or with a soft towel; the child may then take its bottle or breast, get its hour's sleep, and there will be still time for it to spend the best part of the day out of doors. Of course in summer, when the child should be out as much as possible, the bath may be given at an earlier or later hour, to suit the circumstances. For a very young infant it is not absolutely necessary to give a bath in the tub; the room should be warmed to a temperature of about 75° F., and guarded against draughts.

The temperature of the bath, if the child is immersed, should be about 90° F., but if it is delicate and young a thorough sponging of the surface will be sufficient, and it should be gradually accustomed to the water until it will of its own accord show a liking for the bath. When travelling, a portable bath, such as is figured in the plate preceding Part II., is a useful companion, and in these days of electric lighting a spirit lamp is a necessity, and should never be forgotten when leaving home.

The question often arises, How long a time should elapse after feeding before the child has its bath? Certainly not less than an hour, better if two hours should elapse after a heavy meal. Of course this refers entirely to a bath by immersion, but for a young infant that is simply sponged and nursed with breast-milk, an hour will be sufficient.

It is often necessary to bring about a glow on the surface of the bodies of children who are delicate, when, for some reason or other, the bath cannot be given; the body should be gently rubbed with either spirits of wine or washing whiskey, to which a little salt may be added to make it more stimulating; or, if the child is very delicate, cod-liver oil may be used, together with rubbing. About a tablespoonful of a solution of Castile soap (scraped) dissolved in alcohol, to a basin of water, is frequently an excellent addition to the sponge-bath. This can be made up by the pint and kept for that purpose.

The child should not be permitted to go out immediately after its bath, nor indeed for an hour or so, if the weather be cold; but as the day's sleep is taken immediately after the bath, scarcely any mother would be tempted to take her child out. Mothers ought to make it a rule never to take a child out of doors on an empty stomach; not only will a child that has been given food before going out be better able to resist cold, but there will also be less chance of it becoming infected by contagious diseases. In most places children and delicate people should be in-doors at sundown; the sudden chilling of the air renders it harmful, and at this time germs of malaria that have been carried upward by the warm day air are precipitated.

If a child objects very seriously to its bath, it is far better to gradually accustom it to being immersed, and this can be readily accomplished as it grows older by teaching it to play in its tub, which should be gradually filled with water; or over the tub can be thrown a light blanket, and the child slowly immersed, gently lowered into the water.

The question as to when a salt bath should be used is often

asked. This, of course, is a matter which, as a rule, should be left to the family physician to decide. Salt water is more stimulating than plain water; it also has the advantage of being especially valuable in cases of chronic enlargements of the glands and tonsils,—a tendency to scrofula. Children who lack muscular strength, are troubled with loss of appetite, or who sleep badly, are especially benefited by salt baths. It is not necessary to obtain what is known as sea-salt, though this is usually sold for that purpose. A tablespoonful of ordinary salt to the gallon is about the strength of sea water.

As children grow older the question arises as to the sea-shore and its advantages, especially sea-bathing. All children who are delicate, those that are scrofulous, those that are threatened with spinal curvature, or who have a tendency to become bandy-legged or pigeon-breasted, improve wonderfully at the sea-shore. As far as the bathing is concerned, surf-bathing or cold sea-water should not be used for children under three years of age; until that time the sea-water can be given in the ordinary tub, to which has been added sufficient hot water to give it a temperature of at least 80° F. Any one who has spent summers at the sea-shore has certainly seen a great deal of the cruel practice of carrying a screaming, struggling infant in the arms and plunging it into the sea-water. We cannot imagine a more barbarous proceeding. The sudden shock from the use of cold water, the fright, is enough to bring on convulsions. A child at the age of two years may have its bathing-suit put on in the middle of the day, run in its bare feet in the sands, bask in the sunshine, get its feet wet in the cool sea-water, and receive very much more benefit than it would from a plunge into the ocean, even if that could be done without the struggle which usually accompanies this procedure. Even for infants of a year old, sponging the neck with cold water and dipping the feet in the same, followed by brisk rubbing, will prevent in many cases the taking of cold. We call the attention of mothers to this point. It will be a very valuable procedure, especially in our changeable winter climate, if

adopted every night before retiring, to prevent the many attacks of cold that are so annoying and prevalent.

Sea-bathing is to be interdicted for rheumatic children, for those with asthma, skin-diseases, and fevers. Kidney-disease, irritable lungs, a tendency to bronchitis, and some chronic eruptions come under the same category. In the case of heart-disease, the stimulating atmosphere excites this organ to too rapid action and aggravates the disorder. Weak eyes are to be kept from the shore, where the air, impregnated with salt and fine sand, and the glare keep up a constant irritation. The same applies to ear affections, but with exceptions, which, however, should be made only under the advice of a competent physician. Little consumptives do better in the interior, as the coast air is too damp for their weak lungs.

Children with tubercular tendencies and those with chronic joint diseases should be sent for residence to such places as Colorado, New Mexico, or parts of Texas. The establishment of children's sanitaria and boarding-schools in these localities should receive attention.

The action of the skin is so essential to good health, that when a child is really ill, a simple sponging of the surface of its skin may not do any harm; of course the water should be tepid, the room carefully guarded against draughts, and the child, after being thoroughly dried, should not be allowed to run out in the cold entries until the skin has entirely reacted. The mother will often say, "Doctor, my child has a cold; shall I wash it?" We may answer that when these precautions are taken, the sponging of the chest and throat, with subsequent friction, is the best thing she can do for the cold.

In regard to the use of cold water in nursery bathing, it is a great mistake to believe that a child should be sponged with cold water, notwithstanding its dread of it and the shock which it gives to its nervous system. A child should be made to love its bath, to look forward to it with delight; it should have a big sponge to play with, and in a very short time, as it grows

older, it will gladly sit in the tub of water, splash around to its heart's content, and get sufficient exercise to avoid any chances of taking cold.

In using soap, great care should be taken that it be pure, with no free alkali, such as the ordinary common cheap soaps. That which is non-scented is to be preferred. After the child has been dried, in summer-time, its body should be powdered with a little starch or talc powder, which has a soothing effect upon the skin ; or in winter-time its chest and back, and the folds of the skin in the groin and axilla, can be greased with a little vaseline, just enough to make the skin soft and pliable, and also to protect it from cold.

There is one caution which we think is in place here: a bath in tepid or cool water for a short time is invigorating; a prolonged soaking in warm water has precisely the opposite effect.

If the child is debilitated during hot weather by the prolonged heat, and a more stimulating bath than the ordinary cool one is required, a teacupful or two of cider vinegar may be added to the bath, with or without the addition of salt. In children who have delicate skins, the red spots or blotchy eruption which appears shortly after birth is usually due to too active use of soap and water immediately following their birth. This can be obviated by following the directions given when speaking of the washing of the new-born babe; but very frequently a child's skin becomes dry, rough to the touch, and needs constant attention to prevent eruptions, especially the much-dreaded eczema of children. Such children should not have salt baths, except when advised by the physician ; they need fresh air, plain food, and probably cod-liver oil.

CHAPTER XL.

TEETHING.

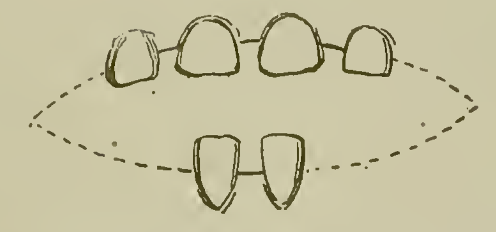
The first lower incisors—that is, the two lower front teeth—are usually cut when the child is from six to seven months old. For some time previous it has probably been noticed that the child has been restless and uneasy, that its sleep has either been disturbed or it has been wakeful. Before this time the child's secretions have been pretty well established. The tears, the saliva, will probably flow readily; indeed, such children usually cut their teeth with but little trouble. It is doubtful whether all the troubles that are associated with teething are really due to that condition. There is no question but that the pressure upon the delicate nerve-pulp beneath a tooth that is bound down by a thick capsule, and probably on top of that a congested gum, may give rise to serious trouble, amounting to convulsions or intestinal disturbance at times; or the irritation which is produced may inflame the gum, and thus starting as a sore mouth, the dryness of the mucous membrane extends to the stomach, and is the starting-point of a severe catarrh or earache.

As a rule, children suffer comparatively little with their early teeth; possibly because, while these are being cut, they are still nursing in many cases, or they have not yet had a large amount of farinaceous food added to their diet. Then, also, the large back teeth and the eye-teeth cause far more pressure on the delicate nerve-pulp, more disturbance in the jaw, and therefore are followed by a greater degree of sympathetic derangement. This sympathetic derangement may show itself in excitement of the nervous system, especially at night, and be one of the most active causes of sleeplessness; also in its action upon the glands that secrete the fluids used in digestion; and it is on this account that the second summer is to

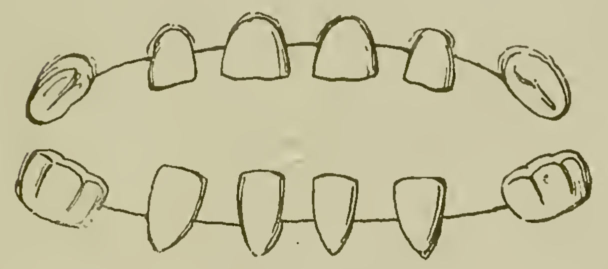
Fig. 35.



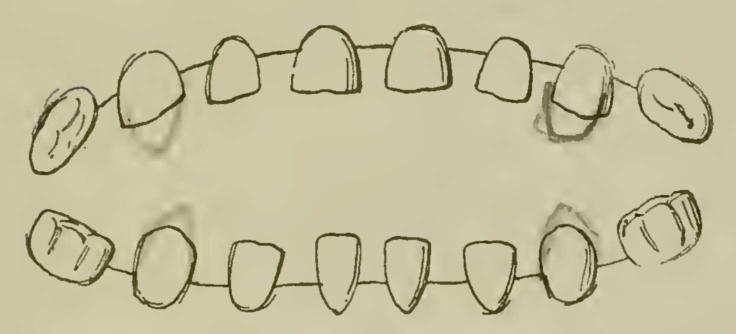
Appearance of mouth at about seventh month.



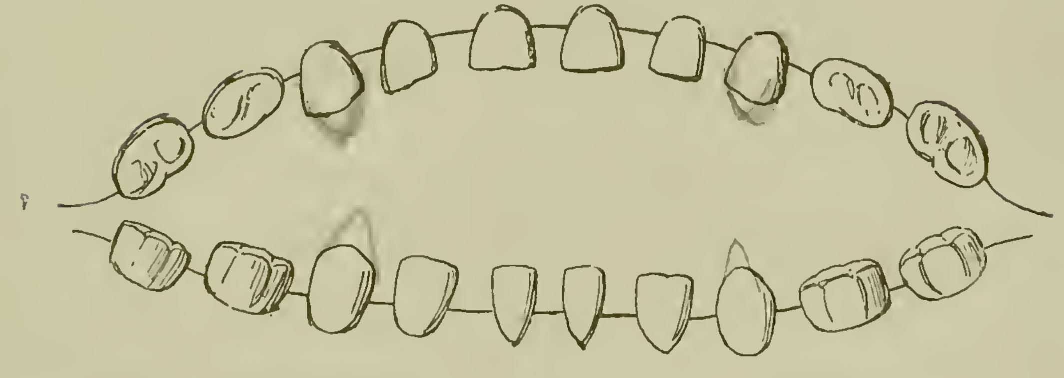
Appearance of mouth at about tenth month.



Appearance of mouth at about fifteenth month.



Appearance of mouth at about twenty-fourth month.



Appearance of mouth at about thirtieth month.

most mothers a dreaded time, as then a baby is usually weaned, and the slightest neglect in the preparation of its bottle will permit of the fermentation of the starchy material that faulty secretion prevents from turning into grape sugar.

Nature's plan is to keep the gum softened by being soaked in saliva; it also uses the bowels as a sort of safety-valve to relieve the congested nervous system. A large watery movement of the bowels will cause a shrinkage in the gums, by depriving them of water, and will often take the place of the lancet. Congestion may be present in the delicate nerve-pulp beneath the teeth, and give rise to annoyance, irritation, pain, and at the same time the gum above give no evidence whatever, by its appearance, of what is going on beneath. A child suffering in this way from its teeth will crave something to bite upon, but as soon as it takes the nipple of its bottle, its fingers, or even its thumb in its mouth, and bites upon it, it will suddenly throw it aside, and show evidences of pain. The relief that comes from the soaking of the gums is very great; it is said that children who suck their thumbs seldom have trouble, and yet thumb-sucking should be discouraged, as it certainly deforms the mouth and renders the upper teeth prominent.

By the time a child reaches two and a half years, it should have cut its entire twenty teeth. They are usually cut in pairs: first the lower two incisors, then the upper two, then the outside two above, then below, next to those first cut; then skipping a space for the eye- and stomach-teeth, the others will come in turn. From the sixteenth to the twentieth month the eye- and stomach-teeth will be cut. By referring to the diagram (Fig. 35) this will appear plain.

The cutting of the teeth by no means always follows in this order, nor indeed do we always find the first appearance of the lower incisors as early as the sixth or seventh month. Sir William Jenner has stated that if a child does not cut its first tooth within a year, it is an undoubted sign of rickets.

We think it well here to make a few remarks on the subject of rickets, that the mother may fully understand what is

meant by the term. To some people no greater insult can be offered than to suggest that their children are rickety; to their mind, the word seems to imply some constitutional taint to be ashamed of. This is a great mistake. So large a proportion of children have rickets to a more or less marked extent that physicians feel the necessity of impressing upon the community the great importance of attention to the very subjects to which this book is devoted. Rickets is a condition, the result of faulty nutrition; it is found among the rich as well as the poor. It is the result, in the latter, of exposure, starvation, neglect; in the former, the direct consequence of high pressure, nervous exhaustion, improper feeding,—in other words, negligence or ignorance. The mother who fails to nurse her babe, and turns it over to the tender mercies of an ignorant nurse and a bottle, should not be surprised if her child suffers in consequence. No more, indeed, should one ignorant of the fact that starchy food will ferment and be productive of harm, be surprised to see her child develop spine-disease or become bow-legged.

By rickets we mean a disease of the nutrition of the body, whereby its natural growth and development are arrested, the formation of bone is retarded, and the pressure exerted by the muscles and the weight of the body causes deformities which later in the disease become permanent. This want of bone-deposit delays the formation of teeth; the interference with nutrition causes wasting of the muscles, produces disorders of digestion, and also shows itself in affections of the lymphatic glands, the liver, the spleen, and the brain. Its causes are bad feeding, want of sunshine, dampness, want of cleanliness; and yet so gradual and slow is the process by which this faulty nutrition shows itself, that many children who are seemingly strong and hearty will manifest signs of rickets towards the end of their early dentition.

Rickets is in nearly all cases developed after birth, usually about the fifth or sixth month.

As regards the normal growth of the child during the first

year of its life, the average growth is about eight inches; during the second year about four inches, and at this time it is supposed to have attained half of its full adult height. As regards weight, at the end of the first year it has gained about three times its weight at birth, but during the second year it has only increased this by about one-third.

We have endeavored to impress upon mothers the great importance during pregnancy of leading the sort of life that will give them good digestion,—plenty of fresh air and exercise,—and of a diet that will supply all the demands of nature. Otherwise, at this time they are the ones who will suffer; nature will draw from them the material to supply bone to their infant. The nursing mother should also be most careful in her mode of life, knowing that the nutrition of two individuals depends upon herself. Should the supply fail, one or the other will suffer. Infants deprived of the materials that go to the formation of bone (lime-salts) will develop rickets though they may be fat; beeause excessive storage of fat is no evidence of health, but, on the contrary, is often evidence of faulty nutrition. The failure of the diamond-shaped opening on the top of a child's head to close before the end of the first year; the delay in cutting its first tooth until the expiration of this period; the tendency to enlargements of the glands, especially the tonsils; disturbanees of the bowels, especially that form where bile does not seem to be properly secreted; the tendeney to perspire at night about the head or neck, notwithstanding the faet that the child seems fat and well nourished, are all, partieularly when found associated in the same case, evidences of rickets, and a child presenting these symptoms should at onee have a ehange of air and diet, and be placed under medical treatment.

These symptoms may oceur in a child that is nursed by a seemingly healthy mother; in faet, we often find that the healthiest looking woman may be the one whose milk is least nutritious. They are apt to occur in a ehild that has followed rapid sueeessive pregnancies, are almost certain to take place

should the mother while pregnant attempt to nurse a child, and will very frequently be noticed exclusively in children who have been nursed too long. Too early weaning, especially if the bottle be made up of starchy food improperly cooked or given in too large quantities, will be a cause of rickets. Such children will develop, besides the other evidences above noted, large bellies distended with wind, vomiting occasionally sour matter, alternating diarrhœa and constipation, and the stools will most frequently be found either chalky or putty-like, and containing quantities of mucus. If a child is late in cutting its first teeth, though rickets may not be present, there is something faulty in its condition. By late, we mean if it has not cut its front tooth by the tenth month. Such a child should be carefully watched, and its diet freely supplied with bone-forming material; it should be given Mellin's food with its bottle, or (Trommer's) extract of malt, without hops (a teaspoonful to the bottle). It should have a salt bath daily, its muscles should be exercised by daily gentle rubbing or massage, and under no circumstances should such a child be allowed to stand on its feet until it has demonstrated its ability to do so after the gradual strengthening of its bones and muscles by creeping.

A great mistake is often made by permitting a child to creep in one position. These children also should be watched with care, that they receive no sudden shock, or blow, or fall. Spinal curvature may be the result; distortion of their hip-bone or pelvis,—a serious matter if they are girls. Diseases of the lungs should be guarded against, as bronchitis, pneumonia, etc., as the difficulty in breathing will press the weak ribs out of position and keep them so, making the child pigeon-breasted.

We have dwelt at length upon this matter in order to show that what is usually attributed to difficult dentition—the head-sweating, digestive disturbances, sleeplessness—in many cases may have nothing whatever to do with dentition, the difficult dentition being simply a symptom in the course of the disease.

Malnutrition is the true cause. There are certain disturbances (mechanical ones), that are caused by the pressure of the teeth upon the nerve-pulps beneath, that are especially noticeable in children of highly-nervous organization, those whose parents are brain-workers, and in these cases we are apt to have disorders of digestion, malnutrition, brain-excitement, resulting in sleeplessness and possibly convulsions. Especially do these conditions manifest themselves during the cutting of the back teeth, as the molars; also the eye-teeth and stomach-teeth; the eye-teeth, so called because their cutting is usually accompanied by more or less disturbance in the circulation of the brain and the upper parts of the face, giving rise to excitement, to sleeplessness, or to catarrh in the nose or in the eyes; and the stomach-teeth because their cutting is usually accompanied by disorders of digestion.

Sleeplessness and irritability seem a constant accompaniment of the teething process. A new-born infant sleeps from fifteen to eighteen hours out of the twenty-four; a child of two years should sleep with little interruption at least ten or eleven hours at night, and from one to two hours in the middle of the day. But sleeplessness is not always an evidence that the child is suffering; habit has much to do with this condition. A child should be prepared for sleep; its hours should be as regular as clock-work, and under no circumstances should it be allowed to pass its sleep-time. Especially is this rule important during the time of teething. The reasons for the sleeplessness of many children are, first of all, our city children are of an excitable temperament; they do not get sufficient fresh air or exercise, and in consequence the fatigue which should naturally invite profound and peaceful sleep is accompanied by a degree of excitement that prevents this.

Sleeplessness from this cause can be remedied by attention to these matters. It is produced by exciting a child just before its sleep-time, especially after it has taken its bottle; its bottle or bowl of food should be given the very last thing. The drowsiness which follows this meal, if once disturbed, will

cause a wakeful night. Among the poor, the father comes home tired from overwork, and the family retire together at an early hour; with the well-to-do, the lights are all lighted, the older children have their romp, or the baby, if it be the first, has to have its half-hour of play with the father, and possibly the excitement of its brain may cause a restless first sleep and wakefulness for the greater part of the night. This is altogether wrong, and is undoubtedly the cause of many brain disorders. For cases of wakefulness from no apparent cause, a hot foot-bath will have a most soothing effect, or, if they still resist, the morning bath can be postponed until evening, giving a warm bath at this time, and a sponging in the morning instead. In these cases, a bottle of food as warm as the child can take it, consisting of Mellin's food and water, the proportions being a tablespoonful of the food and water to fill the bottle, which will put the child to sleep. If the wakefulness is due simply to excitement, the child seeming perfectly well otherwise during the daytime, medicine should be avoided unless specially ordered by a physician. The habit of giving bromide, for no other reason than simply wakefulness, is a mistake.

Another cause of sleeplessness is insufficient nourishment; we sometimes see such cases, where the mother is gradually losing her milk: its bulk remains probably the same, but it is losing its richness or quality. Children fed on condensed milk alone are sometimes underfed, from the fact that the milk is given too highly diluted. One part to twelve of water should be the strength up to the second or third month; after that, about one part to ten or eight, as the child grows older, or, better still, increasing the quantity of cream, and from a pint and a half to a quart of the mixture in the twenty-four hours; but if the child seems hungry after each bottle, give it more until it is satisfied. But we fear that among those who will be readers of this book the greater cause will come from overfeeding. A restless infant, and especially a child about a year old, who tosses in its sleep, cries out, mutters, dreams, is one

who in all probability is receiving food in excess, or is certainly not getting rid of the surplus in a proper way. If the mother notices that a sleepless, restless child, at whatever age it be, has a furred tongue, that its breath is foul, that its urine is scanty, high-colored, or that it passes water very frequently, probably wets its bed at night, is constipated, and the movements are light and pasty, she will know that the child needs a laxative, to be followed by a change in its diet,—a dose of Husband's magnesia, about a quarter of a teaspoonful, or, probably better than all, a dose of castor oil, followed next day by a limited amount of milk, substituting chicken-broth and avoiding oatmeal or beef-juice until the bowels become more normal. Castor oil can be given in warm water in which has been dissolved a peppermint drop, or a tablespoonful of liquid soda mint, a preparation now so well known that it can be obtained at any drug-store. The "soda mint" compressed tablets should be kept in every house, as they are frequently useful for "hiccups" or slight indigestion, though for infants the liquid is better. This form of sleeplessness is most apt to be noted at about the end of the first year. With some children the constant diet of oatmeal without any variation, the daily use of the expressed juice of beef, and at the same time large quantities of milk, which at this period is not often much diluted, will bring about the form of digestive disturbance just mentioned, and a degree of nervous excitability that is often referred to the teething process alone. On that account barley is preferable to oatmeal.

We often hear of children who are said to be suffering when cutting their back teeth, and upon investigation find that they are taking about a quart of milk a day, with a tablespoonful of Mellin's food in each bottle, an ounce or two of the expressed beef, possibly a bowl of oatmeal food, and in addition are constipated, get no fresh air,—in fact, are city children, surrounded by all the disadvantages that our changeable and treacherous climate affords; viz., overheated houses and impure air. A child of this sort, if given chicken-broth instead

of beef-juice, less Mellin's food, thin bread and milk instead of oatmeal, allowed to drink freely of water, and given an occasional laxative, will soon cease to suffer with its teeth. Over-feeding—stuffing, even with good, wholesome food—is the cause of much of the disorder and febrile attacks of children, to say nothing of the "sweets" that are permitted between meals.

Sleeplessness may arise from pain; especially is this the case in bottle-fed children, who suffer from neuralgia, muscular soreness, possibly vague rheumatic pains, supposed by many to be caused by the fermentation of the sugar or starches which they are unable to digest. A child that is fed upon too much sugar will develop acidity; the same with starch; this leads possibly to rheumatism, or rheumatic neuralgia, called growing pain, and eventually to rickets, restlessness, sleeplessness, or sudden starting, soreness to the touch, no desire for exercise, peevishness, or possibly extreme pain upon movement. When the child is lifted suddenly, or is handled while dressing, it will cry,—all important symptoms of this condition.

An extra-sensitive nervous system will probably cause neuralgia through the jaw and head, earache, in some children, from tooth-pressure; this cause is recognized from the fact that these children will avoid anything placed in the mouth, even the nipple of their nursing-bottle. The gums may be slightly swollen, but not inflamed or in themselves tender, but the least pressure upon them with the finger will cause intense suffering. In a case of this kind, if severe,—the child restless, starts in its sleep, refuses food,—the gum should be lanced. A cross-cut that will open the capsule of the tooth will in a moment relieve the pressure. If this is impossible, a hot bath or hot foot-bath should be given, also an enema of warm water, and if the child still suffer, and the mother is away from the doctor, she may give two grains of bromide of potassium, or five drops of the elixir of the valerianate of ammonia, the latter to be repeated in the course of an hour, if

necessary. These are the cases in which the bromide of potassium, if given judiciously, is of the greatest value; they present the purely nervous type, and the nervous system should be soothed by precisely the same mode of treatment that one would adopt for a severe neuralgic headache. The bromide may be given with a teaspoonful of syrup of lactucarium, or a teaspoonful of orange-flower water. If the excitement is great, the child of a year old should take about four grains of bromide; should a convulsion threaten or occur, the proper treatment is warmth and counter-irritation to the legs, and an enema of two ounces of water, at about the temperature of 100° F., containing one teaspoonful of the tincture of assafœtida. After the foot-bath the child's legs should be thoroughly wrapped in a blanket, and the only food given it for a time should consist of the blandest kind, such as barley-water, wine-whey, or chicken-tea.

Dr. A. Jacobi, on the treatment of convulsions, writes as follows:

"Remove the injurious substances from the stomach. If vomiting have not occurred or not sufficiently, it should be provoked by tickling the fauces, and friction of the præcordial [heart] region. These, as a rule, will suffice, but if they do not, quantities of warm water or mustard water will answer a good purpose. The syrup of ipecac is a doubtful and unreliable preparation. Purgatives should not be given in the beginning; large enemata will act more favorably, as warm water, or warm water with antispasmodics, such as assafœtida, or local stimulants, such as turpentine.

"Fever, unless it be high, requires no special treatment. As a rule, cold applications to the head will act well when there is a tendency to convulsions. Cold applications to the heart will reduce the temperature of the whole body. A warm bath will frequently do good. I *do not advise bathing or handling the child much while the convulsion is on.* When thirst is very great, small quantities of ice-water should be given often, or Seltzer water, or Vichy or Apollinaris.

"Solid food must not be given."

A teaspoonful of the tincture of assafœtida in a teacup of water is the proper strength for an injection.

Mothers should *not* give their children ipecac in this condition, it being very irritating, and the strain produced by vomiting may be productive of harm. Ten drops of the aromatic spirits of ammonia, or ten drops of brandy, whiskey, or gin, in two tablespoonfuls of warm water, are far better, when given to the child as soon as it can swallow; if there is any offending matter in the stomach, it will act sometimes as an emetic.

There is another cause of restlessness and sleeplessness from teething, that due to the congestion of the gum and inflammation of the mucous membrane of the mouth. We more frequently find this condition when the back teeth are being cut, and in children who secrete but little saliva. The gum is found swollen, red; the mouth is dry; the child will turn away from more solid food, and will eagerly drink water to allay the irritation in its mouth. Frequently, during the second summer, it will be accompanied by diarrhœa, from the fact that the mucous membrane extends to the stomach and bowel. Very often small ulcers (aphthæ) form in the fold of the cheek or the surface of the gum, become coated with secretion, and are exceedingly painful. If there is disturbance in digestion, little round vesicles, which burst and form ulcers with a grayish coating, will form on the inside of the cheek or the lips, and on, or beneath, the tongue. These aphthæ will annoy the child extremely, and produce sleeplessness; they are the result of indigestion, not of teething, though frequently associated with it. The physician will probably give a little calomel and soda to correct the digestive disturbance, or the mother can give some magnesia, or from ten to twenty drops of spiced syrup of rhubarb with a teaspoonful or two of soda mint, given once a day until the bowels become regulated; at the same time the child can have its mouth washed gently with a soft piece of linen, with a solution composed of

a pinch of borax, a teaspoonful of glycerin, and a tablespoonful of rose-water.

The congestion of the gum of which we have been speaking causes the child to crave salty food; indeed, this is an effort of nature to relieve this condition by inducing a flow of saliva. Lancing the gums will often be of great service, by the relief it gives to congestion; the incision should be deep enough to cut through the capsule of the tooth; instead of this the child should be given something to bite upon, and it will probably obtain relief in that way. The small bone of a well-boiled ham is salt, and the child will eagerly suck it and frequently bite it. A chicken-bone, slightly salted, is also useful, or the child may be allowed to bite on a piece of rare roast beef, and possibly the eagerness with which it will seize upon it may cut the gum from below with the sharp points of its tooth. Children who suffer thus from their gums often get relief from Mellin's food, tied in a rag to suck or bite upon.

To sum up, the object to be secured is the free flow of saliva; it will relieve congestion and soften the gum. It is a mistake to rub a gum under such circumstances by hard, dry friction, but if the little one suffers so as to disturb its sleep, the mother's finger, dipped in the syrup of lactucarium, or even in paregoric and glycerin, ten drops to the teaspoonful, can be gently carried over the tender and inflamed gum, and, by gentle pressure, soothe instead of irritate; and now and then a little firmer pressure may allow the point of a tooth to force its way through. Some children will eagerly suck a piece of ice wrapped in linen, and it will relieve the congestion of the gum.

In these cases a hot foot-bath again has its advantages, by relieving the congestion of the head and mouth; or, if the child is constipated, the operation of a laxative will be followed by relief to its congested gum. The latter will shrink, and a point of the tooth emerge from its captivity.

CHAPTER XLI.

DIET AFTER EARLY DENTITION.

After a child has cut its twelve teeth, it is well to give it more solid food than that which it has been accustomed to take. The milk diet has been continued, or the bread and milk, up to this period, in addition to the mutton-broth, chicken-broth, or beef-soup, and our endeavor now should be to encourage the digestion of more solid food by gradually adding it to the diet to which the child has been accustomed. In almost every house is kept on hand what is known as *stock;* this forms a very valuable addition to a child's dietary, as it is nutritious, palatable, and can be flavored so as to make a change. A child about two years old may have a more solid mid-day meal, composed of a piece of rare tenderloin or juicy mutton-chop, with some well-boiled rice or a thoroughly-roasted, dry, mealy potato, well minced, in addition to its soup, or the white meat of a tender fowl, or sweetbread finely chopped, first heated, though not fried. For its breakfast, instead of the bottle, a child of this age may take about a tablespoonful of cracked wheat (which must be thoroughly boiled or steamed), or oatmeal, or yellow corn-meal, or white grits of moderate consistency (thoroughly boiled), and milk. A little salt should be added to these while boiling; this is preferable to flavoring with sugar. We think, indeed, it is better than using salt and butter; butter used in that way will certainly upset a child's digestion. The sanitary foods (cereals) prepared at Battle Creek, Michigan, are useful in this connection.

A soft-boiled egg, with bread and butter and a tumbler of milk ("cambric tea"), is about the best breakfast a child can have at this age. If it sits at the table and is taught to eat slowly, it will not become dyspetic. Between times, if the child is thirsty, a drink of milk is admirable. With its dinner,

water is probably better; we have certainly found it so in children who are of a bilious habit. It is a great mistake to give a child sweet things *before* its meal; after dinner it may be allowed to have some mild dessert, light custard or pudding, sponge-cake, a baked apple, or, indeed (after it has cut its twelve teeth), a piece of ripe, raw apple or peach will have a good effect on its bowels. The great advantage of bringing a child to the table to eat with its parents is that it is taught to eat properly, to masticate its food thoroughly, which is the only way of avoiding dyspepsia; and also, that the child can thus be trained to see but not ask for things that it knows it should not have. It is a great mistake to so spoil a child that it will refuse when at the table the proper sort of food, and cry constantly for that which is forbidden. A taste of this or that at the table may not result, for the time being, in an attack of indigestion, but the parents are sure to suffer for it in the future. We so often make the mistake of believing that children are rendered strong and healthy by inattention to these matters of diet and clothing, that carelessness makes the child hardy, that the child who is strictly brought up is usually a sickly one. We acknowledge that at times great mistakes have been made by over-carefulness, that the scientifically-brought-up child is not always the most healthy. This carefulness may be carried to extremes, as may everything else. It is always well to make your list for the child's bill of fare as large as possible, and give it its choice; but always adhere to the lines of digestibility, and avoid those articles that every one knows are absolutely indigestible or at least harmful and irritating, such as veal, pastry, unripe fruit, sweets in quantity; and do not imagine that, because children sometimes escape the dangers which indulgent parents bring upon them, the words of advice only come from those who are too highly scientific in their ideas.

The highly-educated classes and those who live by their brains alone are notoriously dyspeptic, and the children of these undoubtedly inherit the weak digestions of their parents

as they do their more highly organized brains and possibly larger heads. They are more subject to acute brain-troubles from this cause, and they are certainly more subject to all the influences which produce intestinal disorders, and cannot possibly digest the same food that will agree with a child of the same age, the offspring of the less intellectual and the laboring classes. This is a matter which every mother should thoroughly understand; it explains to her why one child will thrive on food that would be poison to another; it will prove to her beforehand, without the necessity of an experiment, that her child would not be made more hearty by feeding on the boiled potatoes, soggy bread, corn-starch, or apple-dumpling that has failed to kill her washerwoman's child. Nature has so constituted food that it is not all concentrated nourishment; in grain, in fruit, in meat, the easily digested portions are associated with certain materials that are harder to digest; in a mixed diet the various substances have different degrees of digestibility, and in this way the digestive juices come more closely in contact with the food, owing to its bulk, and the muscular contraction of the stomach and intestines is promoted by the mass of material which passes through them. It would be, then, a mistake to feed a healthy person entirely on concentrated nourishment; the intestinal digestive juices would fail to be secreted, the liver would become congested and diseased, the bowels would be coated with mucus and would fail to act, and the refuse from the destruction of tissue, which is normally carried off by them, would remain behind and poison the system. But during illness, when digestion is checked, and when it is necessary to supply in small amounts the most concentrated nourishment to sustain the system of the patient, then the well-known preparations of peptonized foods, of concentrated meat-extracts, are not only most valuable but often absolutely indispensable.

After it has cut its twelve teeth, the child will naturally desire a greater variety of food, and within bounds this de-

sire may be satisfied. Its bill of fare should include articles that are easy of digestion,—mutton, beef, sweetbread, fowl of various kinds, soft-boiled eggs, scrambled eggs, or light omelet; vegetables, as carrots, spinach, young beans, young beets, asparagus, old potatoes,—the latter well boiled and mashed, or roasted; by all means avoid parsnips, cabbage, turnips, etc. For fruits, baked apples, raw apples scraped, oranges (of course only the juice), grapes (avoiding the skins and seeds), peaches (provided they are not picked green and then ripened); and *avoid* berries of every kind, also pineapples, green apples, etc. Figs, dates, and raisins are all bad for children at this tender age.

The seeds of raw berries, also cherry-stones and chestnuts, are apt to lodge in a certain portion of the intestine and become impacted, thus giving rise to a serious disease that will require surgical interference.

Dr. S. S. Adams, of Washington, has given us an interesting *résumé* of the subject, and we will quote at length from his valuable paper:[1]

"For convenience it is necessary to assume that the child has been deprived of the breast-milk at the twelfth month, and to formulate a dietary accordingly. The eruption of the lower central incisors, during the seventh or eighth month, seems to be the indication to mothers to begin supplemental feeding. Very few infants pass far beyond this physiological epoch without it. . . .

"The object being to prescribe a suitable dietary for the child, in health and disease, from weaning to puberty, it will be best attained by making divisions to conform to the recognized anatomical and physiological changes in the organism. The following divisions seem, therefore, to meet all the requirements: 1, twelfth to eighteenth month; 2, eighteenth to thirty-sixth month; 3, third to fifth year; 4, fifth to eighth year; 5, eighth year to puberty.

"While most mothers will appreciate the value of milk as the chief food for infants during the first year, very few will

[1] Keating's Cyclopædia of the Diseases of Children, vol. i. p. 337.

be convinced of its value as such after weaning. Several months before the child is weaned, in many instances, it has had some of the farinaceæ, and also, probably, meat-broths. If weaning takes place before the eruption of the molars, the diet should be milk. If it is weaned during the summer months, milk should be its only food, although the molars and, perhaps, the canines have appeared. If, however, the child does not seem to derive sufficient nourishment from the milk, it may be given some additional food, provided the weather be cool, but always remembering that its chief constituent must be milk. If it seems to thrive on milk alone, it will be advisable to limit it to it until the eighteenth month. It is the exception, however, when a child will be satisfied with milk until this late period. It is generally necessary to supplement its food by adding some farinaceous aliment. If there is a tendency to loose bowels, barley-water is preferable. It is made by grinding a tablespoonful of the grain barley and adding to it six ounces of water: this should be boiled for fifteen or twenty minutes, salt added to suit the taste, and the mixture strained. This decoction should be made fresh twice a day and kept cool. It should be added to the milk in the proportion of one to three or one to two. The prepared barley may be used in the same manner, but it is not so reliable. If constipation is the rule, oatmeal may be used by preparing a decoction similar to that of the barley. Arrow-root should not be used, on account of the large proportion of starch it contains.

"Bread jelly has been highly recommended by Churchill and others as an excellent food for children just after weaning. It is made by taking a quantity of the soft part of stale bread, breaking it into small pieces, covering it with boiling water, and allowing it to soak for some time. The water is then strained off, and fresh water added. This should now be boiled until it becomes soft; the water is then pressed out, and the bread on cooling will form a jelly. A portion of this should be mixed with sweetened milk.

"In some cases beef-tea will be well borne. That made in a

bottle swimming in a water-bath does not contain soluble albuminoids. It contains large quantities of salts, and should not be given when there is a tendency to diarrhœa. Excellent beef-tea is made by mincing one pound of lean beef and adding a pint of cold water and ten drops of dilute hydrochloric acid. This should stand for two or three hours, with occasional stirring. It should then be left to simmer for fifteen or twenty minutes, when it will be ready for use.

"Beef-broth is not very nutritious, and is not recommended. Mutton-, veal-, and chicken-broths are nutritious, and are applicable in many cases. It must be borne in mind, however, that mutton causes constipation, and veal diarrhœa. . . .

"With the sixteen teeth the child should be allowed a more liberal diet. Its digestive apparatus is now capable of digesting food which has been masticated. It may be allowable to give it stale, well-cooked bread, and butter, or crackers. It may also be given a little mashed white potato, with gravy. A sandwich of scraped lean beef and bread, seasoned with salt or sugar, will be relished, and is very nutritious. It may have a piece of rare beef or a chicken-bone to suck, care being taken that it does not swallow the pulp or bone.

"Peptonized beef preparations have been recommended by the recognized authorities.

"In regulating the regimen of a healthy infant during this period, very little change is required in its food. It should be fed five or six times, at the same hours, every day, but should not be awakened for the purpose. If it desire its food before its accustomed time, it should have it.

"First meal, 6 A.M.—A cup of milk, with cream biscuit or a slice of buttered bread.

"Second meal, 8 A.M.—Stale bread, broken and soaked in a tumblerful of rich milk.

"Third meal, 12 M.—A slice of buttered bread, with about half a pint of weak beef-tea or mutton- or chicken-broth.

"Fourth meal, 4 P.M.—A tumblerful of milk, with crackers or a slice of buttered bread.

"Fifth meal, 8 P.M.—A tumblerful of milk, with bread or crackers.

"Towards the latter part of this period, when the child has sixteen teeth, it may be desirable to substitute the following:

"First meal, 6 A.M.—Bread or crackers, with a half-pint of milk.

"Second meal, 8 A.M.—A tablespoonful of oatmeal, cracked wheat, or corn-meal mush, with milk, and a couple of slices of buttered bread.

"Third meal, 12 M.—Bread-and-butter, milk, and a soft-boiled egg.

"Fourth meal, 4 P.M.—A piece of rare roast beef to suck; mashed boiled potatoes, moistened with dish-gravy; bread and milk; and a small portion of rice, bread jelly, or farina.

"Fifth meal, 8 P.M.—Milk and bread or crackers.[1]

"This is a modification of the diet laid down by L. Starr; but the writer usually insists that the infant should be confined to milk, milk and barley-water, or milk and oatmeal-water, during this entire period. When his advice has been followed, the perils of the 'second summer' have been avoided.

"Fruits and berries of all kinds should be interdicted.

"Every case of infant-feeding must be regulated by its own indicated requirements. There is no uniform rule applicable to all. Each must be studied carefully, and that mode of feeding must be adopted which proves best suited to it.

"The child should not be permitted to sit at the family table. It may have a separate table, where it can have its frugal meal without being tempted by unwholesome dishes.

"The diet in sickness during the first period must be regulated by the nature of the case. It is impossible to prescribe a regimen suitable to all sick children.

"Vomiting is unquestionably the most frequent symptom to be controlled. It may be due to overfeeding, or to some

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[1] Often it would be preferable to give the fourth meal at three P.M., and the fifth meal at six P.M., especially in winter, so that the child can be put to bed by seven o'clock.—K.

fault in the quality of the food. When it is caused by over-feeding, a diminution in the quantity of food, as well as a longer interval between meals, will usually correct it. If it should be caused by a defect in the quality, this should be discovered and remedied. If the ejected matter is sour-smelling, the alkali must be increased. Frequently, forced abstinence will correct it; and in many cases small quantities of food given every fifteen, twenty, or thirty minutes will have a salutary effect.

"Diarrhœa is often the result of improper feeding. The food may be too concentrated, or its quality may be poor. When it is due to too much solid food, the indicated treatment is to confine the patient to a liquid diet. If the quality of the food is not good, it should be improved. In many cases the addition of barley-water to the milk will prove effectual in checking the diarrhœa.

"Constipation may often be corrected by adding oatmeal to the second meal, or oatmeal-water to the milk.

"It should be the invariable rule to confine children to a liquid diet as soon as any impairment of digestion or assimilation is noticeable or they become ill. Milk should always have the preference. It may be given pure, diluted, boiled, or, perhaps, predigested. In rare instances milk will not be retained by the stomach, or will be passed from the bowels only partially digested. In such cases a mixture of equal parts of milk and lime-water, given in teaspoonful doses every ten or fifteen minutes, will not infrequently be retained and digested. In some cases where milk cannot be retained, barley- or rice-water may be temporarily substituted. In other cases beef-tea, beef-essence, or beef-juice may be administered in small quantities, frequently repeated, with marked benefit. Tea and coffee should not be allowed.

"In weakly children the following may be given:[1]

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[1] The following are very good recipes, recommended on high authority: For beef-essence take one pound of beef free from skin and fat, chop as

"*Chicken Jelly.*—Clean a fowl that is about a year old, and remove the skin and fat. Chop it, bones and flesh, and put it in a pan with two quarts of water. Heat slowly, and skim often and carefully. Let it simmer for five or six hours; then add salt and mace or parsley to taste, and strain. Set away to cool. When cold, skim off the fat. The jelly is usually relished cold, but may be heated. Give this in small quantities, very often.

"*Wine-Whey.*—Boil three wineglasses of milk, and add a wineglass of sherry or port wine. Strain, and add a wineglass of warm water. A wineglassful of this may be given once or twice a day.

"*White Wine-Whey.*—To half a pint of boiling milk add a wineglassful of sherry; strain through a fine muslin cloth, and sweeten. A tablespoonful of this may be given every two or three hours.

"*Eighteenth to Thirty-sixth Month.*—It is quite as important to regulate the diet of the second period as that of the first, but much more difficult. At this period the child is walking, and often helps itself to indigestible substances. It now has all its milk-teeth, and is capable of mastication. Its mind is

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fine as mince-meat and pound in a mortar with two tablespoonfuls of water. Put into an earthen jar with a little salt, cementing the edges of the cover with pudding paste; then put the jar in an oven or tie tightly in a cloth and keep in a pot of boiling water for three hours. Strain through a coarse sieve. Give two or more teaspoonfuls.

For chicken-broth take half a chicken, one quart of water, a small bunch of sweet herbs, one blade of mace, and salt to taste. Put into a saucepan and allow to simmer gently for one and a half hours, carefully skimming in the mean time. Then strain and cool. When cool remove all fat from the surface. This may be warmed as needed.

Mutton-broth is made by taking one pound of the scrag end of the neck of mutton, a small bunch of sweet herbs, half a turnip, and a little salt. Put into a stewpan and pour over it three pints of cold water. When it boils, skim carefully, cover closely, and allow it to simmer gently for an hour; then strain, cool, and take off all fat. This may be warmed as required. Pearl barley or rice may be added, but must be boiled thoroughly.

generally sufficiently active to be taught what edible articles it should have. Its power of masticating, its flow of saliva, its good digestion and assimilation, and its increasing bodily growth demand a greater variety of food. If it reach its second period during the summer, and have the appearance of health, and seem satisfied with its milk and simple food, it will be prudent to wait until cool weather to change its diet to a more substantial kind.

"It is now admissible to allow it to eat at the family table, because the opportunity to begin its training early should not be overlooked. It can be taught to eat slowly, that certain articles are not suitable for it, and that it can have enough of the proper kind of food. When a child frets for different articles of food on the table it is generally because some imprudent person has allowed it to taste them. If it is not tempted by tasting other, it will be contented with its simple food. It should be fed at least four times daily, and occasionally will require a few crackers or a slice of bread-and-butter between meals.

"First meal, 8 A.M.—A portion of well-cooked oatmeal, wheaten grits, or corn-meal mush, with a liberal supply of milk; cold bread-and-butter; and a piece of finely-cut, tender beefsteak, or a soft-boiled egg.

"Second meal, 12 M.—A bowl of chicken or oyster soup, or weak beef-tea; milk, with bread or crackers, and butter.

"Third meal, 4 P.M.—Roast beef, mutton, chicken, or turkey; fresh white fish; mashed white potato, moistened with gravy; bread-and-butter; and rice and milk.

"Fourth meal, 8 P.M.—Milk, with bread or crackers.

"It may be necessary to give a glass of milk and a piece of bread-and-butter between the first and second meals; and if the child is particularly hearty the same may be occasionally required in the early morning. Towards the latter part of this period fresh ripe fruits are admissible, provided due care is taken to prevent the ingestion of seeds and rinds. A popular fruit is the banana; but the writer's experience has been

such that he considers it more productive of eclampsia than any other fruit, and consequently he cannot recommend it.[1]

"The meal-hours vary in different communities, so that those for children will be governed by the local customs. It may be necessary to give the principal meal earlier than four P.M. It must be remembered, however, that most children sleep the greater part of the afternoon, so that if they eat dinner at two o'clock they will be asleep during the digestion of the bulk of the day's solid food; on the other hand, if the meal be at four o'clock there will be active exercise after it to aid digestion and assimilation.

"It will need constant watching to prevent it from obtaining unsuitable food.

"Frequently the neuroses, as eclampsia, 'night-terrors,' petit mal, and the numerous symptoms attributable to 'worms,' may be directly traceable to the presence of indigestible food in the alimentary tract. A brisk purgative seldom finds the 'worms,' but generally allays the excessive exaltation of the nervous system by removing the offending material.

"When the child is suffering from an acute disease, its diet should be limited to milk and beef-tea. In chronic ailments, or in protracted convalescence from acute disease, each case must be treated by its individual requirements, while good judgment will render valuable assistance in the selection of those foods which are easily digested and which possess the maximum quantity of nutritious matter to the quantity ingested. In sickness, tea and toast are favorite articles, but only load the alimentary tract with innutritious matter.

"During the third period—*from the third to the fifth year*—the difficulty of regulating the child's diet will be great. It has now reached the age when its friends will humor it with

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[1] The plantain, or banana, is brought to this country green, and on that account is indigestible. When picked ripe in its native land it is most digestible. It is said that a pound of ripe bananas is equal in nourishment to a pound of bread or a pound of steak.—K.

knick-knacks and table-food of difficult digestion. It has twenty teeth, and its friends cannot understand why it should not have such food as a healthy adult can digest. A devoted mother, or usually grandmother, will argue that all her children, at this age, were fed from the table and were not injured. Such children lived in spite of mismanagement. Granting that its diet must be more liberal at this age, it must still be restricted, for even now the presence of indigestible or undigested food in the alimentary tract may be productive of reflex nervous disturbances.

"Its activity and waste and repair demand an increase in the quantity of nutritious food. Three substantial meals a day will usually suffice, but occasionally a snack between meals will be required. While it is well to apply the rule of regularity, it is not always prudent to enforce it, especially if the child is hungry. The practice of children running to the pantry and helping themselves should be discouraged. In such cases children do not eat enough at the regular meals.

"It is impossible to lay down 'a bill of fare' for this period, but a frugal meal can be selected from the following:

"BREAKFAST.

"Corn-meal mush; oatmeal; wheaten grits; hominy; with plenty of cream.

"Potatoes, baked and stewed.

"Eggs, poached, soft-boiled, and omelet.

"Fish, fresh, broiled.

"Meats.—Beef hash; broiled steak; stewed liver and kidney; lamb-chops; chicken fricassee.

"Tomatoes, sliced (occasionally).

"Bread.—Cold, light; Graham; entire wheat; corn; muffins, plain and Graham (occasionally); corn- and rice-cakes.

"Fresh ripe fruit may be given in moderate quantity.

"Highly-seasoned food must be avoided.

"LUNCHEON.

"Soups.—Oyster; bean; chicken; consommé.

"Vegetables.—Potatoes, baked and stewed; sliced tomatoes.

"Meats.—Beefsteak; lamb-chops; cold lamb or mutton.

"Bread.—Cold rolls and soda-crackers.

"Fruits in season.

"Rice and milk.

"DINNER.

"Soups.—Consommé; noodle; oyster; cream of barley; potato; chicken; and chicken stew.

"Fish.—Fresh, baked, broiled, and boiled.

"Meats.—Beef, chicken, lamb, and mutton.

"Vegetables.—Potatoes, rice, cauliflower, macaroni, peas, tomatoes, beans.

"Bread.—Well-cooked wheaten.

"Desserts.—Rice and milk; light puddings; ice-cream occasionally.

"Fruits and berries in season (fresh and sound).

"The regimen of the sick during this period does not differ very materially from that of the preceding, except that, generally, a more generous diet may be allowed. If the illness be of a nature demanding liquid food, the principles already set forth will be applicable. In all cases of illness the food should be reduced in quantity and changed in character, although the patient may not be confined to liquids. As soon as the appetite becomes impaired, the child should be put upon a simple diet. Frequently, in children of this age, too much or deteriorated fruit will cause digestive disturbances. Withholding the fruit for a few days will usually effect a cure. The child should always have its fruit selected for it. When sick, knick-knacks, jellies, and fancy dishes should be forbidden. If the illness be protracted, and the food be digested and assimilated, it should have the most nutritious aliment. This rule is especially applicable to scrofulous, syphilitic, rachitic, and tuberculous children. We need not wait for the manifestation

of these diatheses. If there is good reason for suspecting their presence, the sooner the select diet is begun the better; and, even if they are not latent in these children, the care in feeding will prove beneficial.

"New troubles seem to arise during the fourth period which require close vigilance over the child's dietary. At this time the milk-teeth begin to decay, and the first of the permanent teeth make their appearance. The child has frequent attacks of toothache, the dread of which prevents him from properly masticating his food. Consequently, indigestion and diarrhœa, from bolting food, are of frequent occurrence.

"Again, the child is old enough to be indulged by its parents with everything they eat: hence the impossibility of restricting the diet as long as it is healthy. . . .

"In sickness the general rule of restricting the diet according to the nature of each individual case is also applicable.

"The physiological changes which take place during the fifth period would seem to warrant the statement that extraordinary care should be exercised in regulating the child's regimen between the eighth year and puberty. . . .

"The rules governing the dietary during sickness are similar to those for adults.

"The use of wines and beers should be prohibited, and that of tea and coffee discountenanced.

"In discussing the diet for children in the preceding pages the writer has not lost sight of the fact that some regard should be paid to the important factor of the circumstances of life. It is well in prescribing a regimen which has stood the tests of the laboratory to remember that such advice is given to a large number who are not able to incur the necessary expense of typical feeding. To prescribe such food as that hereinbefore recommended for the child of the laborer, whose wages are scarcely adequate to support his large family, would entail hardships on those whose affections are strongest for the weak and afflicted. The expense necessary to obtain cream, milk, and milk-sugar will not be considered by people of even

moderate circumstances, but will be difficult for the mechanic and impossible for the laborer. Therefore it is important in selecting a food for children, either well or ill, in the lower walks of life, to recommend that which will be healthful and of reasonable cost."

As thorough digestion and nutrition require fresh air, mothers should bear in mind the importance of letting those children that eat heartily keep out of doors as much as possible. The overfeeding, even with nutritious food, in our hot American houses during winter-time, is undoubtedly one of the great causes of those disturbances of the liver which are so frequently met with. It is the same process almost that is used in the making of the *pâtés de foies gras*. The Strasburg geese are overfed and overheated. Constipation, which is so common in these bilious children, cannot be overcome by laxatives or purgatives, and mothers should avoid their use or their abuse. Let a bilious child be allowed to drink water freely, to have a good run in the open air with its clothes sensibly loose, ride on its tricycle, play with its hoop, jump rope, and restrict its diet; the biliousness will then rapidly diminish and the bowels become regular.

"After the eruption of the temporary teeth, the most important particular is their preservation. They should be preserved (if possible) until they are replaced by the permanent set. If the temporary set are preserved, in due time absorption of their roots takes place, the little crowns become loose and fall out, or can be easily extracted. Premature removal of the temporary teeth often causes irregularity of the permanent teeth in this way. It is not that their removal shortens the maxillary bone, but when they do not occupy their respective place, the bone does not grow as it should, consequently when the permanent teeth are ready to be erupted, there is not sufficient room between the teeth for proper development, and they are forced out of their regular positions

"It is a well-known fact that the structure of the deciduous teeth is more delicate than that of the permanent set, and

they are almost invariably subject to decay, and the deposit of a calcareous salt, commonly called 'tartar.' This salt, or tartar, is a precipitate from the saliva; it is often found firmly attached to the teeth near the gum margins. There are several varieties of tartar, but we will only speak of the kind most destructive to the deciduous teeth; this is called 'green stain,' and is very deleterious to teeth-structure. When once allowed to deposit on the teeth, it gradually encroaches beneath the gums, causing irritation, inflammation, and finally suppuration; periosteal trouble ensues, and other serious complications are liable to follow. In addition to this the green stain, as seen on the deciduous teeth, has the effect of chemical abrasion, which softens their structure, causing the teeth to waste away. When it is found to exist, it should be carefully cleansed off, and a suitable wash prescribed to prevent its recurring.

"Lastly, we will call attention to the first permanent tooth, which is erupted when the child is in its fifth or sixth year, and is called the 'sixth-year molar.' This is the largest of all the teeth of the permanent set, and gives prominence to the cheeks. This tooth is often mistaken for a temporary tooth, and as such allowed to decay; in fact, we are often called on by the parents of the little sufferers to extract this tooth, and when we protest, they say, 'Why, is not that tooth soon to be shed?' Indeed, they seem to be greatly surprised when told that it is a permanent tooth, and very important to preserve the regular features of the face. When it is found that the teeth are decaying, they should receive the earliest possible attention. It is a common error to suppose that, because these teeth are temporary, they do not require attention; or if any anxiety is felt about them, it is that they are not allowed to remain too long in the mouth. When the child finds that by the act of mastication the food is forced in upon the nerve through the decayed cavity, and suffers violent pain from it, he will not try it again. They will swallow their food whole, causing indigestion and its attendant evils. Acidity of the saliva is the common cause of caries of children's teeth.

This may be determined by the test paper and corrected by proper treatment."[1]

Dr. E. T. Darby, of Philadelphia,[2] whose large experience in dentistry entitles his recommendations to earnest consideration, writes,—

"THE CARE OF THE TEETH.

"The care of the teeth should begin in infancy. As soon as the temporary teeth begin to make their appearance, they should receive the attention of the mother or nurse, while the child is still young; they may be cleansed daily with a soft linen or muslin rag, but as soon as the teeth are all present in the mouth a small soft tooth-brush should be used upon them once or twice daily. The child can early be taught the use of the brush, and not infrequently a child two or three years of age will become so habituated to its use that it will not feel comfortable until its teeth have been properly cleansed. Stains upon the teeth are not only unsightly even in the mouth of a child, but they may be of such a character as to be injurious to the teeth. The green or brown stains which are sometimes seen upon the labial surfaces of the teeth are usually the result of an abnormal condition of the oral secretions, and a microscopic examination will often show them to be of fungous origin. These stains when present should be polished off, either with a fine powder of precipitated carbonate of lime or with a pine stick dipped in fine pumice-stone.

"*Salivary calculus*—or tartar, as it is commonly called—is found upon the teeth of all persons, although not to the same extent. It may be of various colors, either white, yellow, or brown or almost black. It is a calcareous deposit from the saliva, and, where mixed with mucus and other substances found in the mouth, precipitates upon the teeth in greater or less quantities. While salivary calculus does not injure the teeth themselves, it has a very destructive action upon the gums, causing

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[1] Texas Sanitarian, November, 1891.

[2] Keating's Cyclopædia of the Diseases of Children, vol. ii. p. 932.

them to become congested and inflamed and to recede from around the necks of the teeth, and the teeth themselves to loosen and fall out. Whenever it is found in the smallest quantities, it should be promptly removed, and the surface of the tooth to which it was attached thoroughly smoothed. The importance of thoroughly brushing all surfaces of the teeth cannot be overestimated. Comparatively few adults, much less children, perform this part of their toilet with anything approaching thoroughness: they simply cleanse with the brush the labial surfaces of the teeth, leaving those surfaces which are more difficult to reach almost or quite untouched, and it is in these hidden places that deposits are found and that caries occurs. The young child should be taught the importance of picking the teeth with a quill pick after each meal, to insure the removal of all particles of food which may have lodged in the interstices between the teeth, where, if allowed to remain, fermentation ensues and decay is almost sure to follow. The use of floss silk nicely waxed and passed between the teeth after each meal and always before retiring at night cannot be too highly recommended.

"*Dentifrices* composed of precipitated carbonate of lime, pulverized orris-root, pulverized myrrh, and cinchona bark, with the addition of a little pure Castile soap, may be used once or twice daily, with the best results. Nothing adds more to the appearance of a child's face than a row of pearly-white teeth, and nothing detracts more than a mouth full of diseased, discolored ones. To attain the former a little care only is necessary in early infancy, because when the habit of caring for the teeth is once acquired it continues throughout life.[1]

"The temporary set of teeth are frequently the seat of caries: hence the importance of early dental treatment. The child of two years should be taken to the dentist, that its teeth may

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[1] We wish to impress upon mothers the great importance of washing the child's mouth with clean water at least once a day. A soft tooth-brush can be used, or a clean linen rag, and we know of nothing better than *listerine* to use with it.

be carefully examined, and if decay has begun on any of the teeth they should be treated as indicated elsewhere. Periodical visits at intervals of six months should be made to the dentist, to insure freedom from pain and the retention of the temporary teeth until they are displaced by the advent of the permanent set.

"At the sixth year of age the first teeth of the permanent set make their appearance in the jaw. These are the first four molars, and their position is posterior to the molars of the temporary set. Great ignorance, even among people of more than ordinary intelligence, exists in regard to these teeth. The belief is general that all teeth erupted in childhood belong to the temporary set, and it is not uncommon for these molars of the permanent set to be allowed to decay until all hope of saving them is doubtful or impossible before the dentist is consulted. They are the largest teeth of the dental series, and are situated where they perform the most important part of the masticating function, and their preservation throughout life is of paramount importance. Every mother and every person who has the guardianship of children should bear in mind, when the number of teeth in the mouth of a child exceeds twenty (ten in each jaw), that all in excess of this number are teeth belonging to the permanent series and should be watched with the greatest care. The loss of a single permanent tooth in early life may not necessarily be attended with inconvenience or injury, but more frequently than otherwise such a loss impairs mastication, mars the harmony of facial expression, and destroys the symmetry of the whole face."

An excellent mouth-wash is the following:

Thymol, three grains;
Benzoic acid, forty grains;
Tincture of eucalyptus, three drachms;
Essence of peppermint, twenty drops;
Alcohol, three ounces.

Pour enough in a glass of water to render it turbid, and use as a mouth-wash.

CHAPTER XLII.

THE BOWELS.

It is very important that a mother should know what constitutes a normal condition of the bowels of her children. At birth, the intestines contain an accumulation which is carried off by the first milk, this milk being laxative in character. The first movements are dark in color and viscid. The passages will then assume a yellow color, and in about two or three weeks will begin to get gradually solid, in part. The passages should have little odor, should not be sticky nor contain mucus, and should be liquid. According to Ellis, "the healthy motions of an infant vary from a light orange yellow to a greenish yellow, from yolk-of-egg color to that of a mess of mustard. The smell should never be offensive, but resembling that of sour milk."

Up to three or four months there should be two or three or even four or five movements in the twenty-four hours; though many children are perfectly healthy who have but one movement in the twenty-four hours, even at this tender age. As soon as a child has had a movement from its bowels it ought to be changed, and it is well to thoroughly anoint the parts with vaseline; anything that causes irritation of the skin—undue acidity of the passages, or too frequent passages from the bowels—will rapidly cause soreness, unless the parts be washed and then thoroughly greased. It is a very great mistake for mothers to use rubber or oil-cloth with the diapers, as it will draw or keep the parts in constant perspiration. In washing diapers soda should not be used. Grease is far better than powder to use on a child's skin. A little white vaseline, as before recommended, tallow, simple cerate, or lanolin, will make the best ointment.

As the child grows older the movements become less frequent; by the time that it is six months old it will have about two passages in a day. These passages, of course, are not always exactly the same in a nursing child; indiscretion on the part of the mother, the use of purgatives, or of certain articles of diet, will so affect her milk as either to cause vomiting or purging in her infant. The child's movements may vary in color, becoming greenish or variegated, or they may become dark or thin (watery), or again they may be very much constipated, hard, round, surrounded by mucus, or the passages may be white, looking like cheese. Constipation may be evident from the very earliest movements of a child's life, and be extremely difficult to overcome.

We will study the two conditions,—constipation and diarrhœa,—and endeavor to point out the cause and remedy in each case.

CHAPTER XLIII.

CONSTIPATION.

Owing to the smallness of the bowel and to its position in the infant, there is not that accumulation in the lower bowel which takes place in the adult, and which acts as a reflex, or sympathetic, irritant, causing the muscle to contract in order to have a movement. This reflex irritation, or desire to have a movement of the bowel, has a marked tendency to return at certain hours,—that is to say, to become a habit,—and when properly regulated at that period of a child's existence when the habit can be established,—when the child is a year old, for instance,—the tendency to constipation which may have existed previously will rapidly disappear, especially as from this time forward the child's bowel gradually changes its position, which allows a greater distention to take place. The cause of

constipation in an infant at the breast is, indeed, one of the most difficult problems to solve that we know of; at times it seems to be a hereditary condition, a lethargy of the intestinal nervous system, which fails to respond to irritation. The contents of the bowel are composed of many materials which have escaped digestion: curds, mucus, the secretions which have been thrown into the bowel to lubricate it or to help digestion; the secretions from the liver especially, which are intended, first, to help digestion by aiding the absorption of fats; second, to prevent decomposition, as bile is a great antiputrefacient; third, the bile contains the refuse, the ashes, that have been thrown off by the liver from the use and destruction of tissue. These materials, if not thrown off by the liver, are poisonous, and give rise to the symptoms known as biliousness. Now, mothers must not make the mistake which is so prevalent at the present day, of imagining that constipation always means faulty action of the liver. If the child be constipated, the passages white or chalky, if there be much flatulence or colic, if the tongue be coated, and the urine stains the diaper with a reddish hue, then there is a decided want of action of the liver, and the constipation has probably a cause which can be removed by appropriate treatment; but frequently the liver itself may be working perfectly well, while a catarrh of the bowel, the result of cold or indigestion, may be seated at that part where the bile flows from the liver into the intestine, and the flow of bile be checked.

The symptoms are very much the same in these two cases, although it is obvious that the cause is different, and the mother who recognizes the condition, but fails to comprehend the difference, and who doses her child without the advice of her physician, may do an immense amount of harm.

For these reasons we have throughout this work insisted upon the submitting of all such matters to the family physician. We are opposed to household works on medical treatment, except so far as they give general information and are part of a liberal education. Every physician knows that with an edu-

cated mother, who is thoroughly in accord with the doctor in his endeavors to understand the child's condition and treat it properly, the chances of success are greater than when the parent is ignorant of the many details which works of this sort impart.

Constipation may be due to the character of the food, to the want of secretions in the intestines, or to the failure of the intestines to contract and propel the material towards their outlet,—what is known, technically, as peristaltic action. An infant at the breast, or bottle especially, may be constipated, and every endeavor fail to give it regularity; yet as soon as it begins to take solid food the bowels will immediately become normal. A mother should recognize these different conditions in order to be able to counteract them. If the constipation depends on the character of the food, its indigestibility, or the rapidity with which the water is absorbed, leaving an excess of solids or curds behind, the movements will be of a cheesy character, putty-like, the masses hard, lumpy; possibly not differing very much in color from what they ought to be, but surrounded by mucus,—in fact, very much resembling putty. The movements may be infrequent, or there may be quite a number of very small movements, showing an irritability of the rectum, and this may be accompanied by what is known as the *diarrhœa of constipation.* This form of bowel-trouble is found especially in children who are weaned from the breast and who are on bottle-food, and its treatment consists in giving freely some of the broths, such as chicken, or beef, a cupful or two during the day; in avoiding a heavy meat diet, or one composed exclusively of milk; and in giving the child its bowl or bottle of thin boiled bread and milk, using stale baker's bread and straining, and making it thin enough to pass through the nipple of the bottle, which should be larger than that ordinarily used. The child should have some preparation of malt or pepsin to aid its digestion: a teaspoonful of wine of pepsin in a claret glass of water immediately after eating or just before, if the appetite is failing; and if the

masses of matter passed still show indigestion, the child should take about ten drops of the aromatic syrup of rhubarb with five drops of the wine of ipecac, every night, in a claret glass of water, until the passages show, by their healthier color, that the bile is being secreted.

For those children who have been weaned from the bottle and are taking thicker foods,—that is, solid diet,—it is a mistake to give water too freely with their meals. The water should be given between meals, as in that way it not only supplies a need of the system, but it cleanses the stomach and bowel of undigested matter and mucus, aids, by its mechanical action, the passage of materials which should be discharged, and relieves constipation. For these reasons a glass of water the first thing upon rising in the morning is recognized as a laxative. If the child have much straining, it will be noted that the passages are streaked with blood; this is caused by congestion of the mucous membrane, and can be avoided by the use of some soothing enema. A small hard-rubber syringe holding about one ounce may be filled with the following:

Sweet oil, a tablespoonful;
Warm water (100° F.), a tablespoonful;
Pinch of salt.
Mix thoroughly.

This, given to the child at the time when its bowels should be opened, will supply something for the muscle to contract upon, and thus clear the mucus out of the lower bowel. If the mucus and streaks of blood still remain, thin starch-water, boiled, should be used in the same way.

Another form of constipation is that which is simply due to want of propelling power in the bowel. In these cases a child will go for several days without a movement, although apparently in good health; when moved, the passages are to all appearances perfectly normal, large, well formed. It is astonishing how much can accumulate in the bowel. Indeed, it is probable that most of the overfed, fat children of the well-to-

do in our large cities, who take but little exercise, consisting only of a daily parade with the nurse, and so dressed that it is impossible for them to get the amount required, have their bowels much distended with matters that finally undergo decomposition and are the causes of the blood-poisoning which foul breath, furred tongue, loss of appetite, languor, and drowsiness indicate,—all grouped under the synonyme of biliousness. A child needs exercise as well as fresh air. After its bath, if the room is warm and comfortable, it should be allowed to have a romp with its mother or nurse and not be cramped by clothing. Throw a blanket on the floor and let it kick to its heart's content, toss and roll, exercise its arms and back and chest; let nature have full play, and such a babe will grow strong and sleep and eat well. Flabby children are constipated simply through want of propelling power in the bowel or in the muscles of the abdomen. For these the treatment is generally divided as follows: the external, the dietetic, and the use of medicines. The external treatment consists in manipulating or kneading the abdominal wall. As this condition exists in individuals from infants at the breast, we might say, until old age,—for it is almost as common with the parent as with the child,—the treatment, more or less modified, is useful for all. After its bath, the child should be placed on a blanket, on its back, on the mother's lap, and the abdomen gently rubbed, beginning by placing the palm of the hand upon the navel and rubbing with a circular motion gently but firmly until the surface is in a glow, at each movement increasing the size of the circle, like the rings in a pond after a stone has been thrown into the water. Soap liniment can be used, or cod-liver oil, or sweet oil, or even castor oil, externally, if constipation be marked. As the contents of the bowel descend on the left side, the movement should be from left to right. One good rubbing a day will frequently be followed by a movement of the bowels. This may be still further facilitated by placing the hand in the same way and shaking the abdomen. Of course, exercise will be of great service in this form of constipation.

For an infant this can be secured by gentle manipulation; for an older child, by passive exercise and the encouragement of out-door sport.

The next form of constipation will include that which is due to derangements of digestion, probably induced by too highly stimulating food, or food which has a tendency to ferment and produce gases. Mucus will be secreted in the bowel when the intestine is irritated by food or cold, and instead of producing diarrhœa, which would have been the result had the intestines been inflamed, may cause attacks of vomiting, colic from flatulence, and the expulsion of gases which have an extremely offensive odor. The child's abdomen is swollen with wind, and the passages are usually offensive, possibly fluid, or they may be hard, dark-colored, and infrequent, accompanied also by a coating of mucus. Children that are fed largely upon eggs frequently suffer in this way, or those who receive a large amount of starchy food, not sufficiently boiled, which remains undigested in the bowel. The children lose their appetites, become peevish, restless, suffer from inordinate distention of the abdomen, and, finally, if the cause is allowed to continue, catarrh of the stomach and intestine and obstinate diarrhœa will follow. Of course, the treatment in cases of this kind is obvious: the diet should be regulated, and such harmless laxatives used as will relieve the child of the offending elements and re-establish its digestion. Stop all solid food for a day or two, also milk and starches; put the child on broths, and give it a dose of castor oil, a teaspoonful or two. A tablespoonful of liquid soda mint should be made quite warm, castor oil mixed with this, and when the oil floats to the surface it can be readily skimmed off and given to the child by the spoon. Sweet oil may be used in this way for an infant, instead of castor oil, if preferred. If there is much vomiting in these cases, and food, such as broths or barley-water, is not tolerated, the nourishment may be given in small quantities, using fresh beef-juice, Wyeth's or Valentine's extract. Five or ten drops of whiskey or gin in warm water should be given every fifteen or twenty

minutes, or two or three drops of aromatic spirits of ammonia, or gum-arabic water and lime-water may be used for a time until the vomiting is relieved. Dr. Walker, of Brooklyn, recommends the following:

Creosote, two drops;
Glycerin, two teaspoonfuls;
Water, a small tumblerful.
A tablespoonful of this every hour.

And if there is much colic he advises,—

No. 1.

Aromatic catnip tea, two tablespoonfuls;
Tincture of assafœtida, ten drops;
Syrup (simple), two tablespoonfuls.

Or No. 2.

Aromatic spirits of ammonia, fifteen drops;
Essence of peppermint, ten drops;
Glycerin, a dessertspoonful;
Aniseed-water, two tablespoonfuls.

A quarter to half a teaspoonful of one of these, in water, every fifteen to thirty minutes, if necessary, until relieved.

Use hot foot-baths (mustard and water), and apply mustard poultices, consisting of half mustard and half meal, to the abdomen, or, if the pain should still continue, an enema of warm water, about half a pint or less, or one of hop tea. When colic and constipation exist, the mother should never give a purgative without consulting her physician, as twisting or constriction of the bowel may be the cause, but recourse should be had to the above-mentioned treatment, which can never be harmful, or to an enema. As regards constipation, we may also mention the fact that when it is obviously due to a want of expulsive power in the child, the use of suppositories is often of value, and when cautiously given they can be used for some months until the child has gotten into the habit of having the bowels moved daily at the same hour. These suppositories may be made either of Castile soap, or coca butter

with glycerin; or the gluten suppository made by the Health Food Company is often very useful. It is a mistake to give a child laxatives and purgatives as a routine practice. Vary the diet; change its bottle-food from one thing to another; encourage it to play; give it out-door exercise. These will often in themselves be sufficient. For older children *bran*, as crackers, is often laxative, or it can be made into bread for a change.

Dr. C. A. Earle, writing on the subject, says,—

"If an evacuation of the bowels does not occur within twenty-four or thirty-six hours after birth, a careful examination of the anal opening should be made; indeed, in some of the large lying-in hospitals a very small enema is given as part of the baby toilet at the first dressing. This demonstrates at once the perviousness of the canal. Next let the mother be examined for a cause of constipation, and, by changing her diet, seek to correct her baby's habit. It may be necessary to administer a mild laxative to the mother, for, as a rule, simple constipation in the child should be overcome without giving it medicines or injections.

"If the child has been provided with a wet-nurse, and is constipated, the question will arise as to the propriety of changing to a wet-nurse with younger milk, in order to furnish more colostrum and less casein. Of course everything of a constipating nature, including starchy foods, is to be excluded from the diet of mothers or wet-nurses whose children are constipated.

"If, notwithstanding these directions, the habit persists, and the child has but a single dry passage each day, and this is attended with straining, some exceedingly simple remedy should be administered to the child. As the simplest of laxatives, I strongly recommend a little molasses or simple syrup in water, and when the passages are very dry and the child is known to perspire freely, we should suspect an insufficiency of water in its system, and to overcome this there is nothing better than pure water internally. If the measures already suggested do

not give relief, of course other treatment must be adopted, and we come to consider local stimulants which may be introduced into the anal opening or into the rectum. Among them I notice the soap-and-gluten suppository (Health Food Company), molasses boiled and moulded into little masses and introduced, and the nozzle of a syringe oiled and inserted and injections of very small quantities of glycerin or water or both combined. Bohn recommends as preferable to any of the foregoing injections of cold water three times if needed in each day, then twice a day, and finally once daily until the cure is assured. Other authorities advise cold water as an injection, to which may be added a small amount of common salt. If enemata are necessary, either warm or cold, use small quantities, one or two fluid-drachms, of water or from ten to twenty drops of glycerin, to which may be added a little water. Large injections of any fluid should be avoided.

"By massage or gentle kneading of the abdomen over the colon (that is, along the outer edge of the abdomen and the motion from right to left) muscular action is stimulated and the desired results are frequently brought about. This process should be repeated two or three times a day."

Dr. A. Jacobi writes,—

"Constipation depending on lack of sugar is very often speedily relieved by increasing the quantity of sugar in the food. This is the case, not only in artificial feeding, but also when the children are fed normally on breast-milk. Such mother's milk as is white and dense, and contains a large amount of casein, is made more digestible, and will produce better evacuations when a piece of loaf sugar dissolved in tepid water is given immediately before nursing.

"Very little medicine should be given in all these forms of constipation, in infants or children. The best, after all, may be magnesia, as there is frequently too much acid in the intestinal tract of the young. It will at the same time neutralize the acid and relieve the bowels. Whenever an addition is necessary, rhubarb will suffice. In most cases an enema will be

sufficient to relieve constipation. It should be given every day for a long time. There is a prejudice against rectal injections which is unfounded. They should not be given too hot, not too cold. They may contain a small quantity of salt, so as to make a two-thirds of one per cent. solution.

"In those cases where constipation is very obstinate, the enema should be given through a tube from four to six to eight inches in length. Beyond that it is usually impossible to introduce a tube."

Water plays such an important *rôle* in overcoming the constipation of bottle-fed babes that we will quote the following from Dr. Jacobi:

"The free dilution of children's nourishment with water is demanded upon the following additional facts. Only to a certain limit will pepsin be furnished for digestive purposes. Probably a portion of this is not entirely utilized. A great quantity of water is necessary to assist in pepsin digestion. In artificial digestion albumin often remains unchanged until large quantities of acidulated water are supplied. Without doubt many disturbances of digestion are to be explained by a deficiency of water, certainly many more than are due to an excess of it, as it is so quickly absorbed.

"For the reasons given, I advocate under all conditions a plentiful addition of water to children's food. In this connection I would lay stress upon the fact that, as a rule, small children receive water only as they get it in their milk. Alike in summer and in winter, it is probable that the fact seldom occurs to a mother or a nurse that a child can be thirsty without being hungry at the same time. Certainly many a discomfort and even sickness in a child is conditioned upon the fact that it has been compelled to eat in order to get its thirst satisfied, and often has to suffer thirst because the over-stimulated and injured stomach will take no more nourishment at irregular and too short intervals. There are also normal products of digestion capable of producing disturbances in the digestive process, chief among which is peptone itself. I have,

therefore, considered it necessary in preparing rules for the feeding of children, which the New York Board of Health has annually published and distributed since 1872, to insist upon giving infants, who cannot ask in so many words for it, an occasional drink of water, at least during hot weather. When there is the least ground for the supposition that the drinking-water is contaminated with germs of disease, or where it is unusually hard, it should be boiled before its admixture with children's food, whether the diet be of milk or a mixed one. In general it will give greater satisfaction to use the boiled water systematically even where there is no apparent urgency for it, for very young infants."

There are times, however, when none of the simple remedies seem effectual; stewed fruit loses its power; enemata do not seem to reach the spot, and indeed they should not be forcibly given nor too frequently. In such cases we have found glycerin suppositories very effectual. They can be obtained usually at any drug-store, or can be prepared from the following formula:

℞ Lanolin,
Glycerin, āā gr. xxx;
Olei theobromæ,
Cerat. alb., āā gr. xv. M.
Ft. supp. No. 1.

When it becomes necessary to use medicines as laxatives, we have several articles that are simple yet valuable. Probably the simplest remedy is a teaspoonful of glycerin. A small piece of manna, the size of a postage-stamp, dissolved in milk, is an old-time but often excellent laxative, as are also the syrup of rhubarb, the compound syrup of sarsaparilla, the syrup of senna,—though the latter is at times apt to give pain,—the elixir cascara sagrada, and the compound liquorice powder. Friedrichshall water and Rubinat-Condal water we have found very useful, though the taste is sometimes objectionable to children, but, strange to say, not nearly as much so as to adults. As a purgative nothing excels *castor oil;* a teaspoonful of aromatic syrup of rhubarb adds to its efficiency.

For older children—those from six years upward—we have found the effervescent table-waters very useful at the mid-day meal (all children should have a mid-day dinner, and avoid a heavy meal at six or seven with their parents). When these waters, such as *Apollinaris*, *Manitou*, etc., are given, we believe the excess of carbonic acid gas should be allowed to pass off, as it only distends the stomach.

It should be remembered that pure water is the best laxative of all.

These suggestions are only made for those who cannot get medical advice; this is frequently the case in the country or in the far West on ranches, and persons intending to live in such places should possess a medicine-chest containing such simple remedies as they may need.

CHAPTER XLIV.

DIARRHŒA.

This is one of the most important subjects for our consideration. The complaint varies from simple frequency in the natural movement to that most violent form which occurs in summer-time; but as the one leads to the other, mothers should be instructed how to treat the earliest symptoms, so as to check them before there is any necessity for medical treatment.

Indigestion is the one great common cause, and, as we have before noticed, indigestion is produced by *improper food* and *overfeeding*, or by those depressing conditions which surround the child and prevent the digestion of its food, allowing it to ferment and act as an irritant. All these causes may act equally as well

in winter as in summer, at the sea-shore or mountains as in the crowded cities with unhealthy surroundings, in older children as well as in infants; but, as a rule, they are very much more active in the overheated atmosphere of our densely-populated city during the summer, and infants that are obliged to stay in town are much more depressed, have less vitality, and their food is more apt to be tainted by the germs.

Overfeeding is so constantly a cause of diarrhœa that it deserves a few words of caution. Many young mothers believe that if an infant cries it is always an evidence of hunger; this is by no means the case; it may simply be thirsty. If it is nursed at the proper time and has received its usual amount, a few spoonfuls of water will often quiet it instead of having recourse to the breast or bottle. We cannot lay too much stress on the importance of water, especially in the summer-time; when given judiciously and frequently it may often save the child an attack of summer-complaint. Give cool water; do not give iced water, but let it be pure, filtered always, and if there is the least suspicion of its purity have it boiled. Do not put sugar in it.

Mothers should watch carefully the urine of their children; if the child cries suddenly, in a rather shrill voice, which is characteristic, it has probably wet itself and should be immediately changed, and the parts thoroughly dried and slightly greased to prevent irritation. If there should be a reddish deposit on the diaper, it is an evidence of indigestion or want of water to dissolve these crystals of uric acid. In such cases the urine is usually scanty. It will be found that a teaspoonful of soda-mint solution in a small teacup of water, or lithia-water, which the child should drink freely or take from a spoon, will, if kept up for two or three days, correct this condition.

The child will cry if its position becomes irksome, if it feels the cold, if its clothing irritates it, or if the bands of its clothes are too tight, owing to flatulence extending the abdomen. Frequently it will cry from irritation of the skin, due to what

is known as prickly heat. In such a case a little vaseline rubbed on will soothe it; or if the cry be sudden and sharp, it will be noted to be one of pain. This is frequently caused by the passage of its water, and the doctor's attention should be called to the parts. All these matters should be taken into consideration and carefully investigated before the child receives more food than its regular nursing every two or three hours.

Overfeeding is generally recognized by evidences of the insufficient digestion in the passages, or by the frequency of the movements, although they may not deviate from the normal condition; or the stomach may become overloaded, and the uneasiness of the child following the taking of food, its restlessness during sleep, with possibly nausea or vomiting, will be the consequences. It is a fortunate thing that a child vomits very readily, as in this way food that disagrees with it, fermenting in its stomach, can be gotten rid of without passing through the intestines, which are so easily irritated by such material. If the symptoms just noted are present, the child's breath be heavy or sour, and especially if it is a bottle-fed baby, it will be well for the mother to encourage vomiting. The simplest means of so doing is to give the child a glass of water, and then tickle the fauces (throat) with a feather or with the finger, making the child gag, or follow this by giving a half-teaspoonful of syrup of ipecac every fifteen minutes until vomiting is produced.

The next form of diarrhœa for us to study is that produced by the food. It is a well-known fact that the nursing mother, living on certain articles of diet, can so alter her milk as to make it a potent cause of indigestion. It is also known that emotions—passion, fright—will so change the character of the milk as to produce the same effect. Also any irritation of the nipple producing in the child a sore mouth will be the starting-point of a catarrh of the stomach and bowel; this can be readily obviated by cleanliness, the use of borax, glycerin, and rose-water as a wash, and vaseline to the nipple to prevent cracking. We have frequently observed the fact that a mother

can depart from this rule of careful dieting, on many occasions, without altering her milk in a way that would affect her own child; whereas the same milk given to another child, should she act as a wet-nurse, would be followed by harmful results. The close sympathy between mother and child is thus kept up after its birth. All physicians know of cases of infants at the breast that have suffered from violent attacks of diarrhœa and convulsions, the result of extreme emotion (fright or passion) on the part of the wet-nurse. It is this, together with the high living to which they are unaccustomed, the sedentary occupation which encourages biliousness, carelessness in diet, and the inability to watch them in every particular as to their functional health, morals, and personal cleanliness, that renders wet-nursing so unreliable.

Certain substances have a peculiar effect upon the milk. Castor oil taken by the nursing woman will purge the child; mercurials will sometimes have the same effect; onions and garlic will be noticeable in the milk and cause indigestion. Alcohol will find its way to the milk; this fact has been taken advantage of by giving the mother malt extract, which not only aids her own digestion, but the alcohol which is in it in small quantities, and also the diastase or nutritive qualities of the grain, possibly stimulate the digestion of the child.

The one potent cause of intestinal disturbance in children, in summer, is stale cow's milk; and by the word stale we mean any milk that has stood some time after milking, unless it has been boiled or subjected to sufficient heat and guarded against atmospheric impurities. Our own experience is that milk fresh from the cow—one that is healthy and clean and has been carefully fed—may be given to a child from a bottle without any manipulation, except slight dilution, and will be digested; whereas the same kind of milk after standing several hours might cause intestinal disorder. It is the atmosphere which does this; it contains germs of putrefaction which are very much more potent in the summer, and which abound in our large cities. It is almost impossible to distinguish this

tainted milk from that which is fresh and pure, the changes being so insidious.

We have said that the diarrhœa of infancy and childhood included every form, from simple looseness of the bowel to cholera infantum. The healthy passages should have little odor, no mucus, no curds; they should have the consistency and appearance of prepared mustard. Occasionally, from cold or slight indigestion, one or two passages may change in appearance; they may become greenish, variegated in color, or they may become more frequent and contain a few curds. If such be the case, and the child is nursed, a teaspoonful of sweet oil and one of solution of soda mint will often be sufficient to restore the passages to their normal condition. If the mother or wet-nurse show signs of biliousness, a dose of castor oil given to her will probably have a good effect upon the child. If the child is bottle-fed, and curds still appear in the passages, it is getting food too full of curd, or its digestion is weakened. In such a case the bottle should be omitted for one feeding, and some barley-water or weak chicken tea substituted, and the child's digestion should be stimulated by giving five or ten drops of the wine of pepsin or a grain of a reliable pepsin in a tablespoonful of water, with five drops of whiskey, before the next feeding; or as much of a powder containing equal parts of lacto-peptine and subnitrate of bismuth as will cover (not heaped) a dime.

If the child does not seem desirous of food, under no circumstances press it; should it crave water, allow it to drink, but not iced water; if there is the least irritability of the stomach, give it a tablespoonful of lime-water or a teaspoonful of soda-mint solution every fifteen minutes or half-hour, until the stomach is settled and the child quiet.

The evidences of catarrh of the stomach and bowel are pain, restlessness, heat of body and head, with unnatural coldness of the extremities, or there may be fever. The character of the pain is peculiar; the child will cry out at intervals and draw up its knees; the abdomen is tense, the muscles firm and

rigid, and distended by gas. The passages, in such a case, are usually liquid and contain curds, are lighter in color than normal, and have mixed with them large quantities of slime (mucus). The tongue is coated; the child will probably crave water, if there is much heat or dryness of skin. Now, this condition can be brought about at any time of year from exposure to cold or from irritating food, but it is usually found in the summer in bottle-fed babies. Should it be allowed to continue for any length of time and the cause not be removed,—by this we mean should the child continue to be subjected to the intense city heat and the same bottle-food,—diarrhœa will soon become excessive, evidences of inflammation will appear,—vomiting, intense thirst, and an extremely watery diarrhœa, tinged with green and containing minute specks of greenish matter; resulting finally in entire loss of control over the bowels: the child will gradually lose consciousness and die of exhaustion.

True cholera infantum is not a very common disease, and what is ordinarily known as cholera infantum, such as we have described, is simply the aggravation of an ordinary simple diarrhœa which has been improperly treated at the commencement, either through ignorance or the force of circumstances. It is impossible for one to fully guard a child against the many causes that conspire to produce catarrhal affections; change of pasture of the cow, change of milk, overheated rooms, and the effects of sudden changes of weather are often beyond control. But as soon as the first symptoms appear, the indications for treatment are absolute. If the symptoms of digestive derangement are very mild, simply consisting of a furred tongue, eructation of sour milk, or the appearance of curds or slime in the stool without any actual diarrhœa, weakening the bottle with a little more water, taking out the farinaceous material that has probably been added to it, giving a tablespoonful of Murray's fluid magnesia, and allowing the child to drink, if it is thirsty, weak gum-arabic water or toast-water, will probably be all-sufficient; but if the child has pain in addition to these symptoms, the treatment is different. In

such cases stop the bottle-food at once, and when food is required give the child a mixture consisting of *a tablespoonful of cream, a tablespoonful of fresh milk*, and *two tablespoonfuls of lime-water.* Be careful not to overload its stomach; feed it at frequent intervals, very little at a time. If it is thirsty, allow it to drink of the gum-arabic water or toast-water. If the child is a year old or more, and especially if it be summer-time, when the thirst is very great milk should be omitted altogether from the diet, and barley-water—made by adding an ounce of barley, crushed, to a quart of water, boiled for twenty minutes and then strained—may be given with condensed milk, one part to twelve; or to this can be added two tablespoonfuls of lime-water when the bottle is made up, and the child given, every two or three hours, as a drink, ten drops of whiskey in one ounce of water and one ounce of lime-water. The white of an egg dissolved in a tumblerful of warm water, to which is added a teaspoonful of glycerin and a dessertspoonful of orange-flower water, should be kept in a cool place and given occasionally, as a drink, if the child is thirsty. To this may be added ten grains of lacto-peptine.

In the cases just described the medicinal treatment would be to clear the bowel at once of the accumulated curds and mucus and relieve the congestion, and for this purpose a dose of castor oil may be given as follows: *a teaspoonful of castor oil, ten drops of aromatic syrup of rhubarb*, and *a dessertspoonful of warm soda mint* (solution). A warm foot-bath should be given, and over the child's abdomen should be placed either a mustard poultice (half flour), a spice poultice, or flannels wrung out in hot water, over which should be sprinkled some essence of ginger. After the oil has operated once, and a large mass of curds and mucus has been expelled from the bowels, the subsequent passages will be of a more natural color, but very cautiously indeed should the mother return to the ordinary bottle-food. If the weather is very warm, the child should be taken daily to some shady spot in the suburbs, where the air is purer and fresher than it is in the city. If pos-

sible, it should for several hours a day be permitted to breathe air that comes off the water. There is no city charity that should receive more encouragement than that which gives river or country excursions to poor children. A few moments' ride in a ferry-boat will often revive a child that is almost exhausted by the heat and is succumbing to summer-complaint. The nervous system has given out, it has lost its control over the blood-vessels, and the serum or watery portion of the blood, that contains all the nourishment, leaks into the bowel and is drained away. The little sufferer dies absolutely of hemorrhage,—white hemorrhage. That is why these teething city babies so rapidly emaciate; that is why they crave water to supply that which is lost. A child, then, should be treated in such a way that its nervous system will be strengthened and once more given control. It should have fresh, pure air,—either the air from the country, or, better, the air from the water, or, better still, the air from the sea. Its tissues should be braced by stimulating, cooling applications; it should be sponged with vinegar and water, or alcohol and water; its feet should be soaked in water containing a little mustard, to stimulate its circulation; the room should be kept as cool as possible, thoroughly aired, free from all contamination by sewer-air or putrefying matters, and the food given should be absolutely pure and untainted.

In all these cases, if in the city, avoid raw milk, also starches of all kinds, even should they be thoroughly cooked. After a child has taken a dose of oil, it can be fed on condensed or evaporated milk, and wine-whey may be given to it as a drink, a wineglassful every three or four hours, should it exhibit any symptoms of exhaustion. After the bowels have returned to their normal condition, the food can be changed to either Pasteurized milk prepared for the bottle, or some of the other preparations mentioned in the chapter on that subject. In these cases peptonized milk is often very valuable, and when a milk diet is returned to, it should consist of *Pasteurized peptonized milk*,—that is, milk sterilized

at 155° F., and containing the necessary amount of Fairchild's "peptogenic milk powder."

It is well for a mother to recognize the fact that her child should abstain entirely from food in these earlier stages of diarrhœa, especially in summer, certainly until her physician has seen the case. She should make it a rule to allow the child to drink freely, if it wishes it, of gum-arabic or toast-water; give small pieces of cracked ice, wine-whey, Valentine's beef-extract or the fresh expressed beef-juice, or some chicken-broth; indeed, the beef-juice and chicken-broth, given with gum-arabic water, make a nutritious and harmless diet in all of these cases. This hygienic treatment alone, in the earlier stages of a diarrhœa, will be of very great advantage, and will materially aid the doctor by paving the way for that medical treatment which he may find necessary in order to bring about a normal condition.

Of course, a diarrhœa may come on very suddenly, with great intensity, and may prove fatal within a few hours. These cases are called cholera infantum. Their suddenness is appalling; their treatment should be immediate. Such cases seem to be caused by a union of all those conditions one of which alone is sufficient to produce diarrhœa; it is a blood-poisoning, originating, possibly, in the absorption of some germ, and aggravated by improper diet, lowered vitality on the part of the child, impure air, and intense heat, continuing unabated day and night. Cases may originate in this way, coming suddenly upon children who have been previously in good health, or this condition may be the result of a protracted and neglected simple diarrhœa. The mother's duty in these cases is always to attend to the hygiene, and by hygiene we mean proper food, judicious bathing, and the placing of her child where it can, for at least a part of the day, breathe pure air.

But the doctor's duties are equally important. Our object is not to instruct the mother how to take the doctor's place,—his duties are distinct from hers; but it is simply to give her an intelligent understanding of what the doctor means when he

lays down certain rules which are to be carried out in the nursing and management of her child, and without attention to which the medical treatment would be absolutely of no avail. It would be ridiculous for the doctor to give a child morphine and sulphuric acid for a severe case of cholera infantum, or salicylic acid or bismuth and pepsin, while at the same time the baby is kept in a close, ill-smelling room, and attempts are made to quench its thirst by the free administration of tainted cow's milk given through a dirty nursing-bottle; and yet how often, even in families that should know better, do we find appalling ignorance in regard to these most important matters!

If the child vomits much, food by the mouth should be avoided and nutritious *injections* given instead, such as a raw egg beaten with warm water and five or ten drops of brandy or peptonized milk, about one ounce every two hours.

CHAPTER XLV.

NURSING OF SICK CHILDREN.

It is proposed in this section of our work to give to mothers and nurses a plain statement of the causes and method of nursing of the more important disorders and diseases of children. By disorders we mean simply functional disturbances; by diseases we mean those disturbances that are accompanied by some structural changes.

It is not necessary to dwell at length upon the appearance of a sick child. We have endeavored to form a picture of a child in the enjoyment of perfect health,—an infant with all its functions working in perfect accord, whose sleep is soft and gentle, who awakes bright and cheerful, who eats with an evident relish for food, and who becomes drowsy as digestion begins: one whose eyes are clear and bright, its skin soft, its flesh firm, bears evidences of health. But when the child be-

comes peevish, restless, or drooping, uneasy after eating, starting in its sleep, when the eyes lose their brilliancy and become encircled with dark rings, its skin is hot and dry, and possibly the hands and feet cold, its flesh flabby and soft, and the rotundity of its form marked by a tendency to angularity, showing a loss of the cushions of fat, it does not require much experience to recognize such as a sick child. Whether or not this deviation from health is simply functional, or due to disease, is not the question we have to deal with; that rests with the doctor; but as he depends on the mother for a true recital of those symptoms upon which he bases his conclusion, a habit of accuracy in observation, one of thoroughness in investigation, should be cultivated by her. This and the thorough carrying out of all the details of treatment, not as a mere machine, but as an intelligent being, one who is capable of exercising judgment, form the essentials of a good nurse, and this every mother should seek to be.

Within the past ten years excellent training-schools for nurses have been instituted in most of our large cities, and the graduates are doing noble work. In most cases of serious illness in families who are able to bear the expense, a trained nurse is the doctor's most efficient adjutant, but in many, indeed by far the most, cases some member of the family has to be impressed for such a duty, and some knowledge of the subject of this chapter becomes a valuable aid.

Miss Catherine Wood, of London, has written much upon this subject, and we will here quote at length from one of her valuable articles.[1]

"The sad experience of every doctor who has had to treat a spoiled child at home will confirm this: the child refuses to take its medicine or food, and the united efforts of the parents and household are useless; it remains master of the situation, a hardened little sinner. Or some particular posture must be maintained to allow an inflamed joint to recover itself; it

[1] Keating's Cyclopædia of the Diseases of Children, vol. i. p. 347.

screams and kicks at all efforts to place it aright, it frets if fastened down, and refuses its food, until at last it is allowed to lie as it likes, and valuable time is wasted. Place that same little one in a children's hospital, in the hands of doctors and nurses accustomed to children, and it at once becomes tractable; all friction and contests are avoided; it follows the example of the next cot, and swallows medicine and food quietly; it submits to be laid down, for it seems the fashion of this nursery and so must be right. Then the atmosphere of play and merriment carries it over the tedious hours of a chronic illness almost unnoticed. Dr. West, who was certainly the pioneer in initiating a specialty in the treatment of sick children, says in his opening lecture to students, 'Children will form at least one-third of all your patients; so serious are their diseases that one child in five dies within a year after birth, and one in three before the completion of the fifth year. These facts, indeed, afford conclusive arguments for enforcing on you the importance of closely watching every attack of illness that may invade the body while it is so frail.' . . . She [the nurse] must also learn how to combine firmness with gentleness, how to insist without coercion, how to win obedience without friction, how to take her patient along with her; and all this can be accomplished only by love and truthfulness. Once win the child's trust, and then it will yield itself a willing slave. The most fearless truthfulness should be insisted on from all those who have to tend the sick child, even when it wrings the loving heart to speak the truth. The pain the child will feel will be far less than upon finding itself deceived, especially when among strangers. . . .

"The poor mothers in their own homes make quite a toil of their children; they will hardly put them out of their arms, and they certainly will not believe that the child can be thriving unless they are dandling it on their knees; both are quite wearied, mother and child. But this is all mistaken kindness. A sick child will thrive best if laid quietly in its own cot, so that the fresh air may play around it, and that it may rest.

Its little face will soon lose the worried look that is so often marked on the faces of the children of the poor, and a look of happiness and content will take its place. It is not difficult to accustom the children to lie quiet; at first they will be restless and fret at not being taken up, but when they see that their frettings are of no avail, with the ready adaptability of childhood they make the best of it, and soon find how much the best it is.

"It is most essential in the care of sick children that they should be supplied with plenty of light and fresh air, in neither case pouring in directly on them, but flooding them all round in generous profusion. They by no means appreciate the darkened room and hushed voice: like the plants in the garden, they expand under the rays of light; and there can be no doubt that the light has a physiological influence on their growth and development, especially so in the case of illness. Therefore in arranging the sick-room, let it have as much of the light as possible, a southern or western aspect, and a free circulation of air through it, by maintaining an interchange with the outer air without making a draught; and this should be kept up by night as well as by day, especially in crowded cities. Of course in certain fever cases, in acute diseases of the brain or diseases of the eye, a darkened room may be required.

"The sympathetic nature of the child is at once affected by any deviation from the standard of health; its organism is like a delicate machine, disturbed by the presence of a minute grain of sand; it at once gives token that there is some morbific influence at work. The severe onset of an illness, its rapid course, and its speedy termination either in recovery or death, are always matters of surprise to those accustomed to sick children; and so it requires that the attendants should be fully on the alert to catch each new symptom, give it its value, and be prepared with appropriate treatment. It is hardly a safe course for the mother to wait until her child's illness has declared itself before she takes action; and even then, as a

mild domestic ailment and an acute disease may alike assume the same symptoms, she would act more wisely to seek some skilled assistance, for, however experienced a mother may be, she can hardly read symptoms aright. Or it may be that one of the infantile infectious complaints is declaring itself; and then for the sake of the other children some system of isolation is necessary.

"Illness at first shows itself in a child by listlessness and loss of appetite; the eyes look heavy; the child may be fretful, especially if disturbed, or it may be drowsy; it will feel hot, and if the temperature be taken the thermometer will generally show an elevation above the normal; but this in itself must not be regarded with disquiet, as a very little suffices to disturb the normal heat of the body; in nearly all cases there will be vomiting and some bowel-disturbance, and then special symptoms will declare themselves. In the older child, one able to give some account of itself, the symptoms generally set in in the same sequence, and they must be taken as a warning that something is amiss. The best treatment is to wait and see what is coming, at the same time placing the child in favorable circumstances,—that is, keeping it quiet and away from its fellows, giving it light food, of easy digestion, seeing that the bowels are not overloaded, and then waiting for the diagnosis of the medical attendant.

"Age has much influence upon the diseases of children, and if it is borne in mind that before the age of seven the body is being built up rapidly, and this means a great expenditure of vital force, it is more easily understood that a small disturbing cause will seriously upset the equilibrium of its powers. It is of more importance to keep a child in health than to restore it from illness to its normal condition; and very much may be done by regularity in all its habits. Appropriate food at regular intervals will drill the digestive apparatus into strong, healthy ways; regular hours of rest and exercise will soothe and strengthen the nerve-centres; the muscular powers will be developed by use, and the mental faculties develop them-

selves in harmony with the animal vigor. There are certain crises in the child's life that must always be reckoned with as causes of disturbance,—notably, the period of teething. This is a sea of troubled waves, over which the little bark must be sensibly steered and it will voyage in safety; but then it is a natural process, for which provision has been made in the child's constitution, and if its surroundings and habits are healthful it will pass over the storm with but little danger. Of more serious moment are the hereditary defects that are ever-present dangers to the child life and will break out into flame with the least spark and will modify acute disease by their influence. If the mother has a good knowledge of her child's constitution, she may do much to defend the weak point by engendering a wholesome habit of living. This much is quite certain, that no two children are alike, and that they will thrive the best who receive the most individual thought.

"Of secondary importance, but by no means to be forgotten, is the child's nursery: here three-fourths of its day will be spent, and its aspect and traditions will never die out of the child's life. It is of paramount importance that it should be bright, cheerful, clean, and wholesome, that its presiding genius should be a lovable, common-sense woman, and that order and method should rule its habits. The little ones will then look back upon their nursery days as some of the brightest in their life.

"It may become the sad necessity to turn this bright room into a sick-ward. In such case, turn all the unnecessary articles of furniture out of the room, take up the carpet, remove the hangings, if there are any, and have at hand everything that is likely to be wanted, extra basins, jugs, cups, and feeders, small pans for the linen, a plentiful supply of water and liberal means of making it hot, baths, and a ready supply of linen. Keep all these appliances handy, but outside the room, and also outside have vessels for receiving the slops, so that nothing offensive may be about the patient. Provide a good supply of some disinfectant in a concentrated form, to be

readily weakened, and let this be freely used on the floor, in the vessels, and for soaking the linen from the patient. Last, but of no less importance, is the choice of the sick child's nurse. It does not follow that either the mother or the nurse is the most fitting; the one may be too nervous and excitable, the other too indulgent or ignorant: what is wanted is a steady, reliable woman, who can manage the patient with kindness and firmness, who can be trusted to carry out orders and yet have a discretion of her own, cheerful and even-tempered, physically strong in the face of an extra demand on her powers, cool and self-possessed in an emergency, and, above all, with a love for her work and her patient. If added to these qualifications there is hospital training, then the right attendant is found. It is very essential that as far as possible the management of the sick-room should be kept in the hands of one person, so that there may be a unity of treatment and that methodical harmony which is of more importance in sickness than in health; and then, if the assistants are obedient, good work may be done. There are few things more harmful than the fidgety nursing that one so often sees in the family. The nurse, if she shows herself to be a woman of tact and sympathy, will soon infuse her spirit into the members of the family, and they will readily work under her guidance.

"There are many little niceties of method and order that form part of the training of a nurse in the hospital wards, that will add to the comfort of the patient. A child with any form of joint-disease or fever is easily washed in the recumbent position on a blanket, being rolled gently from side to side, and in the case of an injured limb it must be steadied with one hand or by a second person, and then there is very little pain or displacement. It is a great husbanding of the strength in fever, especially typhoid, to keep the patient always lying down, and the whole of the person can be properly washed in this way. This is the sovereign preventive of bed-sore, especially in cases of paralysis, where the evacuations are not retained, and enables the nurse to see at once any

weakness of the skin. Complete drying of the skin must be insisted on, and the liberal use of dusting-powder, and then a child may lie for months on its back without any ill effects. An important part of the nurse's work is to prepare her patient for a physical examination, and to do this quickly and readily without undue exposure is a sign of good training. It is very irritating to a doctor to watch a nurse fumbling at buttons and strings, and it wearies the child. Before the time of the doctor's visit she should have all the clothing loosened, and a blanket warming at the stove to wrap the child in if it is to be taken out of bed. If the child is to be examined in bed, the night-gown and vest are drawn over the head and placed on the stove to keep warm: this is a little detail, but it is important for a delicate child to be saved the chill of cold garments when exhausted by the examination. A loose wrap will serve to cover the parts not under observation; and if the doctor uses the towel whilst examining the chest, be sure that it is one well aired. If the patient is removed from the bed, the nurse will take the child in the warmed blanket on her lap and be ready to adjust it to the doctor's needs. Some little gentleness and coaxing are required to prevent the child from being frightened, and a few moments of time must be spent in winning the patient's confidence and allaying its fears; and if this is successfully accomplished, the patient will probably look upon the whole as a game for its amusement. Should some operation be necessary without an anæsthetic, it is far better to tell the child that it will be hurt a little bit, and if the instrument be kept out of sight the fright will be very momentary. It is marvellous how patiently children submit to painful remedies if only they are treated with candor. In putting on hot applications it must be borne in mind that the child's skin is more sensitive and tender than an adult's, and that the test of the nurse's hand is not sufficient; the child's sensations must be the guide. It is a cruel thing to put on a fomentation or poultice too hot, and it does no good if it excites the child. If a blister is ordered, it can be

put on more efficiently with blistering fluid, care being taken that it does not run, and if put on at night the child will generally sleep through it; the after-treatment will be according to the instructions of the medical attendant. Children are very tolerant of blisters, and in wise hands they are useful remedies. The application of leeches is more complicated: the sight of them must frighten the child, so they should be dealt with quickly and decidedly. The easiest way is to turn the box on to the part, which should be first well washed, and then wait until they have all taken; or take them up in cotton-wool in the mass and hold them on; in either way the child does not see them moving about, and if the cotton-wool is left on they will not be very evident. They must be left until they drop off, and then the part washed, pads of lint or absorbent wool put on, and the whole bandaged up. The nurse must be on the watch for after-bleeding and report to the doctor.

"Leeches should not be placed on the prominence over a bone, nor on a vein, nor on any part that receives pressure. The pain is not severe, and the fright is caused more by the sight of them than by their bite. If possible, the child should be kept quiet after the application, or the bleeding may become troublesome.

"A very frequent remedy ordered is an enema, either as a medicine in diarrhœa or constipation, or as a means of giving food. Its nature and quantity will be prescribed by the doctor, but its administration will be in the hands of the nurse. Supposing it is to check diarrhœa, it will probably consist of starch and opium, and should be made as small in bulk as possible,—not more than two or four teaspoonfuls of mucilage with the quantity of opium prescribed; if to deal with constipation, it will be large in quantity, such as a pint of soapy water warm, or gruel and castor oil, or soap and castor oil; and after the injection has been given leave the patient quiet until there is a desire to return it. The tube should be well oiled and passed up the rectum gently as far as it will go. In

giving nutrient enemata, the food must be made as concentrated as possible, and be a little thickened with starch powder or arrow-root. Four ounces is as much as the bowel will retain with advantage.

"A nurse who knows her work will know that she has to put out the urine for testing by the doctor: it should be a small quantity taken from the first passed in the morning, and let it be put aside in a clean vessel and covered over.

"It may be that she is instructed to measure and record the amount of urine passed in the twenty-four hours: in such case she must have a suitable vessel, such as a marked jug or glass, provided for her, and then should begin her observations thus. Let her fix on an hour, say nine A.M., at which to take the observation: on the first morning let the child pass water at that hour, and then throw it away: all the water passed subsequently is to be saved, and at nine A.M. the next morning the child is to be invited to pass water, and then the whole quantity is measured, recorded, and thrown away. If the specific gravity is to be taken, the nurse must be shown how to use the little instrument that weighs it, and how to record it.

"It is also part of the nurse's duty to examine the evacuations and report on them, and in any case of doubt to save them for inspection. On this point there is a great deal of ignorance and diversity of opinion: one nurse will call that diarrhœa which another nurse will name only 'a little looseness,' and so on. The presence of slime and blood in the evacuations should be at once reported, and the stool saved for inspection; also the presence of undigested food. The frequency of the action and the quantity must likewise be observed, and intelligent answers given to the doctor's questions.

"The diseases of young children are so frequently induced by bad management that the medical attendant will rely very much for the success of his remedies upon the intelligence and good management of the nurse. He may lay down theoretical rules for feeding and rest which may be entirely upset by the wilfulness of his patient. What is to be done with a child

who will not take milk, where that is the special diet indicated by its complaint? What is to be done with a child who will sleep by day and feed by night? Or with one who refuses all food? In diarrhœa and vomiting, the administration of food has much to do with the recovery: first of all it must be suitable, then it must be given in such quantities as will suit the digestion, then it must be given regularly and with patience, and it must be freshly prepared. All the vessels used for it should be scrupulously clean, for the least trace of decomposition will upset the stomach.

"The popular feeding-bottle with the india-rubber tube is a great offender: it is almost impossible to prevent particles of food from clinging to its inner surface, and as these decompose they will taint the most carefully prepared food. The bottle and nipple need careful scalding and rinsing, and should be kept in cold water betweentimes. If an infant hand-fed is troubled with diarrhœa and vomiting, look to the bottle first. As a subsidiary measure, and one of some importance, see that the loins and the abdomen are quite warmly clothed. In feeding a child who has a delicate or irritable stomach it is of great importance to give the food in small quantities and as frequently as the digestion will bear.

"In all diseases of the respiratory organs the child requires a warm, even temperature, not made stuffy or poisonous by want of efficient ventilation, but a constant temperature kept up with a free interchange of fresh air. This requires a little management, but it can be done. What is essential is that the external air, which is the freshest, should be admitted steadily, and the temperature kept from falling below 60° F. The means by which this is to be brought about must be left to the nurse's ingenuity, but she must remember that letting in the used-up air off the staircase and passages is not ventilating with fresh air.

"At times it is a great relief to the patient to moisten the air with steam; this is best done by surrounding the bed with some light curtains or screen and then letting the steam come

into the bed from some suitable apparatus, care being taken that there is an escape from the top of the bed, or the curtains will become damp. This is an essential in the treatment of laryngitis and diphtheria after the operation of tracheotomy, it being advisable to moisten and warm the air before it enters immediately into the lungs through the tube.

"It will not be necessary in an article of this nature to give instructions for dealing with diphtheria or laryngitis, as these cases require incessant care on the part of both medical attendant and nurse. Still, a few hints of arrangement may be of use. There are few cases that demand more skilled nursing than diphtheria, and the attendance on such cases should be always put into the hands of old, experienced nurses, especially after the operation of tracheotomy, as careful feeding and watching by an experienced nurse are essential to recovery. One small precaution may prevent the nurse from taking a disease which is propagated by the breath, and that is to keep her mouth closed whilst standing over the patient, and to use a disinfectant for washing the hands before taking her meals. A basin of weak carbolic solution should be put near the cot for washing the sponges, etc., used about the patient, and all feeding-cups, spoons, and glasses must be kept apart. Linen over a piece of waterproof to make a bib and pinned over the neck of the child's night-dress is a clean way of keeping the neck dry and wholesome; for it must be remembered that the diphtheritic discharges are most irritating to the skin. To sum up, a nurse in dealing with these cases must be prepared for a work that will tax all her skill, patience, and vigilance: her patient will require incessant watching, and will make endless demands on her ingenuity. Instead of pocket-handkerchiefs, some rags that can be burnt at once are advisable.

"When infectious diseases are in the house, very much may be done by way of precaution in the use of disinfectants for the linen and the discharges before they are taken out of the room, as it is in these that the germs of disease are conveyed. A sheet kept moistened with some disinfectant, and hung over

the outside of the door of the sick-room, is very effective. Then, of course, there should be no intercourse between the inhabitants of the sick-room and the rest of the household, and the nurse and friends should change their garments before going out. The floor of the sick-room should be swept with saw-dust moistened in the disinfectant, and all dust and refuse should, if possible, be burnt. In scarlet fever in the desquamating stage, it is the practice of some doctors to have the patient rubbed over with an ointment; but, whatever treatment is adopted, it is essential that the skin be kept clean by frequent sponging with warm water, and by baths, and that the patient be kept warm in bed until the process is over. Every precaution should be taken to hinder the dust from the bed or room from being scattered about.

"Measles is a much more unruly disease to deal with; it starts infection in the early stage, before the eruption has declared itself, and so spreads among a household almost unchecked. The same rules of disinfection will apply to this; it is of importance to keep the patient in a warm room, in bed, until the eruption has quite disappeared, and longer still if there is any tendency to lung-disease, as shown by a continued high temperature and the state of the breathing.

"In this and in all other eruptive diseases the diet should be light and nourishing and with but little animal broth or tea in it, as this is apt to be over-stimulating, except when contra-indicated by great prostration. Careful observation of the temperature is of great assistance to the nurse. It begins to fall about the third day; but if it persists high or rises above 103°, then the nurse must be on the alert for some complications and look out for all symptoms that may aid the doctor in detecting the mischief, and for her part she must keep her patient warm, lying down, pay attention to the evacuations, and support the strength with careful systematic feeding.

"Whatever may be the nature of the illness, one great essential in its nursing is scrupulous cleanliness in the person of the

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patient and in all its surroundings. A sick child should be washed all over every day, and sometimes twice a day; every part of its body should be examined, that the first sign of a sore may be detected, or any change in its condition, such as a swelling, discoloration, or enlargement about a joint, and such information should be handed over to the doctor at the earliest opportunity. In the case of young babies, their skin requires washing and drying each time the napkin is changed; a nurse who knows her work well will be able to keep her charges clean and their wants anticipated without giving in to these lazy ways. If the patient is to be clean, so must also the bed, and all soiled linen at once be taken away, not pushed under the bed out of sight, nor one wet end of the sheet tucked under the mattress, but absolutely put in its proper receptacle, where it will do no harm. The hospital draw-sheet is very useful on the sick-bed; it can be quickly drawn away without much disturbance to the patient, and another substituted. A draw-sheet is a narrow, long sheet, about one and one-half yards long by three-fourths of a yard wide, of a coarser material than the linen, and is placed under the body of the patient, sometimes with a square of mackintosh under it; it tucks in well and keeps things straight. . . .

"Some children dread the water: the origin of this fear is very often caused by roughness in washing them, or by hustling them too suddenly into a bath. Rickety children are essentially tender to the touch, and they require gentle handling when in the bath.

"As the bath is essential for both the healthy and the sick child, the nurse must use her ingenuity to overcome the fear. An ordinary warm bath should be of the temperature of 98° F., and this should be decided by the use of a thermometer and not by the nurse's hand. Let the child be quite ready for the bath when the bath is ready for the child, or it will be cooling. When the bath is over, have at hand a warmed blanket on which to place the child whilst being dried; let the drying be done quickly and the child be put into its

warmed garments for bed. If a douche-bath is ordered and the regular appliances are not handy, place the child in an ordinary warm bath, standing if possible, and then pour a jug of cool water down the spine from a height, or on to that particular part for which the douche is ordered. Rub the part well with a rough towel, so as to get up good circulation, and knead it with the hand. If a bath is ordered to reduce the temperature, its temperature should be 65° F. The bath being brought to the bedside, the patient is lowered in on a blanket and kept in five or ten minutes, according to the doctor's orders; then the patient is dried quickly and put back to bed. . . .

"It is an essential in the clothing of a sick child that it should be loose, light, easily changed, and sufficient. A sick child does not make the same use of its bedclothes that the sick adult does, and so some warm jacket must be put on to keep its chest and shoulders protected. The bedclothes also must be light and warm, and not doubled in a heavy fold over the chest, perhaps already overweighted with some difficulty in breathing.

"When the patient first gets up it is necessary that the surface of the body be thoroughly well covered with light warm clothing, put on quite loosely. Woollen clothing is more warmth-giving than cotton, and is lighter. Neither in sickness nor in health should the child's body be confined in stiff clothing; binders and stays of all kinds are a mistake; they interfere with the free use of the muscles, and do not improve the shape. In construction also the clothing should be simple and easily put on and off. It would not be advisable in this chapter to advise any patterns or styles for the children's dress; but, laying down these rules as above, feminine ingenuity may easily devise a shapely garment that will harmonize with them and with the child's requirements. In sickness, the flannel vest and bed-gown require frequent changing; and it is a great soother of the night's rest to change the garments entirely at the child's usual bedtime. In dealing with surgical cases which must be kept in one

position, it facilitates the process to have a night-gown open down its whole length; the same applies to patients with typhoid fever. . . .

"In preparing a bed for an operation, or where the patient must remain on it for a long time, a firm hair mattress should be selected, and a continuous board placed under it, two sheets folded straight down the centre, so that they can be easily withdrawn and kept in their places with a draw-sheet, and then the rest of the clothing arranged so as to give the most warmth. All creases must be carefully avoided, as they will cause a sore; and if pillows are required to support a limb, they should be firm, like sand pillows, and as small as possible. A good feather pillow is often of use for slinging a limb; but every appliance must be adjusted to the restlessness of childhood and to the tender nature of its skin. It is wonderful how tolerant children are of one posture and of long confinement in bed, if only they are placed in a comfortable position and well amused; and they will maintain an ordinary standard of health under such circumstances, if fed sensibly.

"It may strike the reader that many of these details are needlessly minute; but it is by attention to such minutiæ that the work of nursing a sick child back to health may be accomplished. Nothing is too small that contributes to such an object, and those who have had much experience in the care of sick children know that all their success will depend upon careful thought for these details.

"There can be no doubt that it is very hard work to nurse a sick child; but there also can be no doubt that the hard work amply repays itself in its results."

All medicine should be kept out of a child's reach; indeed, it is always well to have a small medicine-chest under lock and key.

A mother or nurse should make it a rule *always to read the directions on the bottle* before administering any medicine. Mistakes frequently occur, especially during periods of excitement, and the wrong medicine administered.

In concluding this chapter, we will quote from an article[1] by Dr. Byers, of Charlotte, North Carolina, on disinfection. The greatest attention to detail is necessary to prevent the spread of contagion from the sick-room, and as many of the acute affections of infancy and childhood are due to contagious disease, this matter assumes an additional interest and importance.

"In each particular disease there is always some peculiar or special portion of the body involved which is occupied by and reproduces the exciting causes of infection. It is to these parts that we must always first direct our attention when beginning to disinfect for the disease. Fortunately for prophylaxis, the exact location of the centres for breeding is known in quite a number of diseases, and we can attack these seats directly. In all the exanthemata this is the case, and in them it is the skin and the mucous membranes which should receive the most attention; while in typhoid fever and cholera it is the discharge from the bowels, and possibly from the kidneys also, which we must particularly attend to.

"For personal disinfection, Labarraque's solution, diluted with twenty parts of water, is suitable for washing and bathing the body. A weak carbolic solution, or a one-per-cent. solution of chloride of lime, will also be found efficient for the same purposes. Oily disinfectant inunction for the skin is one of the best methods of preventing the detachment of epithelia and pus, and should be used from the commencement of measles, small-pox, scarlet fever, and chicken-pox. It is found better and more agreeable when mixed with camphorated olive oil or with carbolic acid and olive oil. The throat and fauces in these diseases should also be washed with Condy's fluid, or a weak solution of sulphurous acid. All discharges from the nose, eyes, and mouth should be received upon rags and immediately burned, or, if upon towels and handkerchiefs, these should be put in a solution of chloride of lime. The stools should be disinfected by a solution of bichloride of mercury,

[1] Keating's Cyclopædia of the Diseases of Children, vol. iv.

one-half ounce to the gallon of water, and all clothing treated by placing it in boiling water to which have been added two ounces of chloride of lime for each gallon. With regard to the disinfection of the apartments, furniture, and hangings, an observance of the directions in the general remarks that are to follow will be amply sufficient for all purposes.

" *Heat.*—Extremes of temperature have long been known to be disastrous to animal and vegetable life, and are doubtless among the most efficient and satisfactory agencies that can be employed for disinfection. Of course it is not necessary to say that fire will destroy the principles of infection, since it is complete combustion. Heat in particular has a powerful and constant effect upon all albuminoid substances, both in coagulating and in desiccating. It is undoubtedly the best means of disinfecting bulky material, such as bedding, curtains, and clothing, and, if they be properly exposed to its action, all the contained life or contagion will certainly be destroyed. Heat is employed as a disinfectant in several ways, among which may be mentioned *dry*, *moist or boiling*, and *steam heat.* Drs. Parsons and Klein have made numerous and elaborate experiments both on the degrees of heat and on the time necessary for disinfection. The results of their investigation show that *dry* heat is best adapted to the usual purposes of disinfection. Ordinarily this kind of heat can be supplied by a common laundry drying-closet or a baker's oven, and will be sufficiently powerful to destroy all contagion unaccompanied by spores. Dry heat has one principal objection, however: it penetrates bulky and badly-conducting substances very slowly, and the time usually allotted for the destruction of germs is far too short for it to be effective. Hence if the drying-closet or oven be used the articles should remain in it at least four hours, and the temperature should not be below 200° or 225° F., the latter being much better. With respect to the amount of heat that can be borne by ordinary fabrics, scorching is said to occur at different temperatures in different materials. White woollens are always soonest affected, and should be carefully watched.

To avoid these bad effects in them, the temperature should never exceed 250° F.; and even this may in a majority of cases be too much for the finest woollens. Dry heat is generally applicable to all that class of goods which can be boiled, and is said to be materially aided in penetration by the addition of a certain amount of moisture, though the moisture is of no assistance in facilitating the destruction of the germs.

"Dr. Henry has been successful in destroying the infective principle of scarlet fever, contained in clothing, by means of a dry heat of only 140° F. kept up for three hours. Most authorities, however, recommend a temperature of at least 225° F. for all kinds of exanthematous disease, such as small-pox, measles, chicken-pox, and the like. . . .

"Koch has found that bacteria in general, free from spores, cannot resist a temperature of 212° F. for many minutes, and that if it is continued for an hour and a half they invariably perish.

"As to the action and results of moist heat or boiling as a disinfectant, experiences are not very satisfactory. Still, if the boiling be kept up for several hours, and a little carbolic acid, or chloride of lime or of zinc, be added to the water, the results can be relied on as effective. Should there be any doubt about the destruction of the germ when lodged in clothing or other articles of similar character, we should not hesitate to employ the highest dry heat compatible with the safety of the goods. The finest fabrics will withstand for a reasonable time an elevation of 225° F., and linens, cottons, and woollens may be trusted to it without the apprehension of any injury or danger. Two hours of dry heat such as has been described will be amply sufficient, and no evil consequence will follow either to the safety of the goods or in the form of disease.

"Steam is considered to be a rapid and powerful disinfectant, experience showing pretty conclusively that at 212° F. it will destroy all contagion, and the complete penetration by steam for five minutes is found capable of thoroughly disinfecting. . . . Steam penetrates far more rapidly than dry heat, and is much

more destructive, in the time occupied, to all germs. A pressure of twenty-five pounds is said to assist materially in its destructive action.

" *Chemical Disinfectants.*—These are employed in the form of gases, liquids, and solids.

" Gaseous substances are employed principally for aerial fumigation, and are applicable for the disinfection of apartments, etc. I shall not undertake to enumerate the various articles of this class that have been used from time to time, but shall simply confine myself to a description of a few of the leading ones, such as experience demonstrates to be effective.

" A number of chemical substances are known to evolve oxygen very freely when brought in contact with organic bases, and in this manner disintegration of the obnoxious matters is presumed to take place. Chlorine, bromine, nitrous fumes, and ferric compounds are supposed to disinfect to some degree by this method. With respect to the chemical reactions that take place in the use of the other substances which will be mentioned farther on, very little appears to be known.

" *Fumes of Sulphur—Sulphur Dioxide.*—The most available, inexpensive, and reliable disinfectant that can be employed for fumigating apartments and preventing the spread of exanthematous diseases is sulphur dioxide, (SO_2). The Greeks and Romans were acquainted with the preservative properties of this gas, and used it as an antifermentative in wine. It is two and a quarter times as heavy as air, and is usually generated by burning sulphur. It has a peculiarly pungent and disagreeable odor, which is perceived when a sulphur match is ignited. Guyton de Morveau, who first studied its action, was of the opinion that it would completely disinfect miasms. Its chemical action is supposed to be due to its power to deoxidize the resultant acid coagulating albuminous matter. For the disinfection of rooms recently vacated by diseased persons, three pounds of sulphur should be burned for each thousand cubic feet of air space. The sulphur can best be ignited by pouring over it two or three ounces of alcohol and applying a

lighted match. The room during the entire period of fumigation should be kept completely closed, and about twenty-four hours afterwards opened and thorough ventilation allowed. Before using this agent, however, all carpets should be taken up, the wall-paper removed and burned, the hangings thoroughly loosened, and every part exposed so that the gas can penetrate everywhere. . . . Sulphurous acid and sulphur dioxide are both destroyed by chlorine and permanganate of potassium, and should never be used in conjunction with either. The great solubility of sulphurous acid renders it one of the most valuable substances with which to disinfect liquids. Dr. Edson, of the New York Board of Health, in a recent report, says that sulphur dioxide is the most practicable and reliable means that he has ever seen employed for the disinfection of the exanthemata and diphtheria.

"*Chlorine.*—This is a pale yellowish-green gas at ordinary temperatures, about two and a half times as heavy as ordinary air. It is a powerful oxidizing agent, and extremely irritating to the air-passages when inhaled. It decomposes ammonia and sulphuretted hydrogen, and affects all compounds arising from the putrefaction of organic matter. It is commonly used for the same purpose as sulphur dioxide, and, like that agent, renders the occupation of the apartments temporarily impossible. It bleaches organic matters and destroys odors, either by withdrawing hydrogen or by direct oxidation. Chlorine is usually generated by means of chloride of lime, moistened either with water or with dilute sulphurous acid. There are several popular disinfectants which contain this gas in sufficient proportions to be of service: among these may be mentioned Platt's chlorides, Labarraque's solution, and Javelle water. Chloride of lime is often used without the addition of an acid, being scattered as a powder in vaults, privies, and gutters. . . .

"Fumigation should always be regarded in the light of an accessory, and should be, when practicable, accompanied by the processes of baking, steaming, and washing. All the wood-

work—walls, floors, and furniture—must be rubbed down and washed with a solution of carbolic acid, one pint to the gallon of water, or a solution of bichloride of mercury, an ounce to the gallon of water, and the clothing and bedding baked, or washed in a solution of chloride of lime. A failure to make these processes complete by leaving a single place or article overlooked will create a new centre for infection, and all the work will have been in vain.

" *Carbolic Acid.*—An important advance was made in disinfectants when the virtues of this substance were discovered and brought forward. The great advantage of it, as a liquid, is that it is slightly volatile, and therefore capable of being sprinkled in apartments and upon substances where it will penetrate every corner and crevice and be of service. It requires about twenty-five parts of water for thorough solution, and in this proportion is a powerful disinfecting liquid against all contagion. It coagulates albumen in the proportion given, and enters readily into union with organic substances wherever it meets them. . . . Its chief property and that of the compounds associated with it is the power of destroying vegetable and animal organisms, and preventing putrefaction and fermentation in them.

" *Bichloride of mercury* [*corrosive sublimate*] in solution is the most powerful and remarkable disinfectant known to science. Investigation shows that it is a deadly poison to all the lesser forms of life, which it kills instantly when employed in proper quantities. It cannot be used in connection with lead, tin, or copper, owing to its corroding qualities. Its power to destroy germs, even in dilute solution, is unique. In the proportion of one to five hundred it destroys vitality in ten seconds, in one to two thousand in one and one-third minutes, and in one to twenty thousand in from fifteen to twenty minutes. Thus it will be seen that *time* is an element always to be considered when the solutions are used in ordinary proportions.

" The fact that corrosive sublimate combines with albumen leads to the conclusion that it interferes somewhat with the

process of destruction, and this is always to be remembered when using it as a disinfectant.

"The following solution is recommended by Sternberg as quite capable of killing all the germs of infectious diseases: bichloride of mercury, four ounces; sulphate of copper, one pound; water, one gallon.

"Dr. Parsons recommends the following solution as suitable for clothing, excreta, etc.: bichloride of mercury, half an ounce; hydrochloric acid, one ounce; aniline blue, five grains; water, five gallons. Mix. This is the standard Solution No. 1 of the Public Health Association, and has been tested thoroughly. It should be labelled '*poison*.'

"*Sewage*.—A large number of substances have been proposed for the disinfection of sewers, cesspools, and water-closets. The mercurial mineral salts are not applicable to sewers or drains, owing to the fact that they corrode the metallic pipes. Carbolic acid, crude, dissolved in water in the proportion of *one* to *fifty*, is a very efficient arrester of decomposition in drains and cesspools, and is in every way preferable. Calvert's powder, composed of about twenty-five parts of carbolic acid and seventy-five parts of alumina and silica, is applicable to the same conditions of use as quicklime.

"The solid absorbent disinfectants, such as dry earth, charcoal, sulphate of iron, chloride of zinc, and chloride of lime, will be found to be efficient in drains and sinks under ordinary circumstances. It should be strictly enjoined, however, that under no circumstances are the dejecta of yellow fever, cholera, and typhoid fever patients to be emptied into sewers or privy-vaults until they have been thoroughly disinfected by the standard solution of mercuric chloride which has been recommended. Filth such as is found in closets, sinks, and privies, it should be remembered, is the chief source of nutrition for the different disease-germs, and therefore such places cannot be too clean nor avoided too widely. Let them be cleaned out often, after being disinfected; and do not allow accumulations to take place under any circumstances, always remembering

that bad odors are the best, if not a certain, indication that something is out of order and that there is danger ahead.

"Sternberg advocates a dilute chloride-of-lime powder composed of one pound of chloride of lime and nine pounds of plaster of Paris. This is clean to handle, and can be sprinkled over everything fearlessly.

"Perchloride of iron is useful for the disinfection of sewage, and when added to it throws down a precipitate of ferric oxide, which is due to its action upon the sulphide of ammonium nearly always present in sewage. It is conjectured that this reaction leads to the liberation of sulphur, which in turn acts as a disinfectant.

"Permanganate of potassium prevents putrefaction in sewage for a short time, and also acts as a deodorant; but it is necessary to use it in large and expensive quantities to get these results, and hence it is not practical."

CHAPTER XLVI.

ACUTE AND CHRONIC NASAL CATARRH.

For the answers to the following questions, which are interesting to mothers in this connection, we are indebted to Dr. Alexander W. MacCoy, of Philadelphia.

How to treat an ordinary cold in the head, with household remedies, for a child over six months of age.

A cold in the head should never be neglected. At the beginning, an attack (ushered in by fits of sneezing and slight feverishness) can often be arrested before the watery flow begins by the prompt use of quinine suppositories, from one-half to two grains each, according to age, introduced into the bowel once or twice in the day; also small quantities of sweet spirits of nitre in iced water (or for older children in lemonade), taken freely. Sometimes large quantities of cold water taken

will act so promptly on kidneys and skin as to quickly relieve the nose. For some delicate children whiskey and water in proper doses may be used. Hot (mustard) foot-baths upon retiring is a time-honored and very efficacious treatment if the extremities are well protected during the night. If the nostrils show watery and mucous discharge, the nasal chambers should be looked after, and the stuffiness and stoppage to breathing through them must be combated by lubricating them within with bland oils dropped in or snuffed up or, better, used as a spray in an atomizer or vaporizer. Albolene and benzoin are two of the most agreeable and effective substances available; combined with a one-per-cent. to two-per-cent. solution of cocaine it is most efficient in relieving the nasal distress and stoppage in the nostrils. Plain cosmoline and vaseline, warmed, and applied in and around the orifices of the nostrils, will greatly add to the comfort and repose of infants. Very often infants suffer more from the accumulation and adherence of the secretion, which soon dries up and renders the small nasal orifices stiff, uncomfortable, and occluded. The frequent application of a weak solution of baking soda (bicarbonate of soda) to the nostrils on a soft rag or absorbent cotton will easily remove this dried secretion, and if immediately followed by the free use of oil or cosmoline, will prevent this annoyance from recurring. Guarding the child from overheated rooms during the day, and especially at night, with the judicious use of quinine suppositories and the application of some benzoin with camphorated oil in the nose, will generally relieve and cure an ordinary cold in the head in one or two days.

1. *At what age do children show symptoms of chronic post-nasal catarrh? What are its earliest symptoms?*

The time at which a discharge from the head occurs, either from the nose or throat, may be coincident with the child's birth. An acute cold in the head often develops during the first week of life, and, followed by a succession of other attacks during the earlier months of infancy, may give rise to symptoms of chronic nasal catarrh as early, at least, as the

first year. (Depending upon some hereditary taint, the symptoms are familiarly known as "snuffles," and date from birth.) A post-nasal catarrh—a dropping of mucus or phlegm from the head into the throat—is only a symptom of a nasal catarrh; without a nasal catarrh existing at the same time there can be no post-nasal discharge. It is probably true that, in young children, for a long time there is no actual inflammation behind the palate—post-nasal space—in discharges from the head into the throat, but the secretion comes from the back of the nose and slides down the palate into the throat; the throat may look red, but this is caused solely by the mucus lying there or constantly passing over it. An acute cold in the head will give rise to a discharge into the throat, which in children will be much more noticeable in the recumbent position. This is also true in the chronic form. One of the earliest symptoms manifested in an infant or child suffering from nasal catarrh is a short, irritative cough, generally very persistent and occurring chiefly at night, disturbing the child's rest to a distressing degree. A cough arising from mucus flowing out of the back of the nose and down the throat, finally tickling the "speaking-box" (larynx), is not amenable to ordinary treatment by cough-syrups, etc., but requires the removal of the secretion from nose and throat. The cough comes on generally after the child has been asleep for some time and the recumbent position has started the secretion downward in the direction of gravity. During the day, the usual watery or mucous discharge from the nose is seen, and frequent attempts at swallowing may be noticed. It is quite unusual for parents or nurses to give much consideration to a cold in the head, and it is more rarely understood that this disturbing cough at night *is dependent upon the state of the nasal passages.* If a cold in the head is overlooked or neglected, as is so often the case, the constant discharge of mucus into the space behind the palate and its continuous flow downward will, in time, produce an enlargement of a gland at the top of this space behind the palate, as well as cause a pharyngitis, which gives rise to a

serious condition and makes what is often called "a weak throat." And the trouble does not end here, but often causes change in the voice, rendering it husky and hoarse, and if left to itself, in many cases causes inflammation of the windpipe and also of the bronchial tubes; and in very many subjects too often renders them weak-chested and liable to acquire some grave pulmonary disease. In the space behind the palate, up in the roof, where this gland of which I have just spoken lies, an enlargement of the gland develops; in some cases where this occurs the tissue hangs down over the nasal openings behind, and causes impeded breathing through the nose, producing mouth-breathing, and causing the voice to become flat and nasal in character. This nasal voice is also dependent upon obstruction in the nasal passages themselves, and gives the true explanation why we are said, as a nation, to "talk through our noses."

2. *Are there any precautions that can be taken to prevent it?*

The precautions necessary to be taken to prevent a chronic nasal catarrh are comprised under the hygiene of infants and children, and the adaptation of children, from birth, to their environments. It is a lamentable fact that infants and children suffer the greatest neglect of proper care of the nasal passages. From the first bath after birth onward, the mucous membrane of a child is put on the defensive. Too frequent bathing (daily) of infants and children, with much too warm water, in overheated rooms, followed by too little friction of the body, is a fruitful cause of "colds in the head." The important task of bathing is generally given over to the "child's nurse" after the first few months. This position is frequently filled by a young girl remarkable chiefly for her inexperience and stupidity. The little innocents are at the tender mercies of such persons, not only in the matter of bathing, but in that of dressing, undressing, proper regulation of amount of bedclothing, and ventilation of the bedchambers. If the natural guardians of children would give more attention to the details of these daily matters of so great interest

to the physical welfare of their offspring, the prevalent nasal catarrh would become much less frequently seen. Overheated bedrooms (furnace-heat night and day) and too many bed-clothes contribute greatly and promptly to an attack of cold in the head, or add to one already present. The child, after being asleep for one or two hours, is found bathed in sweat; such discomfort renders it restless, and it naturally seeks relief, and is soon outside of the coverings. This condition of affairs, kept up night after night, soon renders the skin relaxed, and greatly enhances the risk of taking cold from the rapid evaporation from the body. The selection of suitable bedclothing is an item of great importance to the child's welfare. Light, porous blankets are the only bed-coverings advised. Luxurious eider-down and wool comfortables, and all coverings of impervious character, are to be avoided. Eider-down is especially liable to be used, because of its light weight, when the atmospheric conditions do not warrant its use. It is only suitable for arctic climates and bedrooms without heat. A great amount of exercise in the open air (life in the country) is one of the best preventives of nasal catarrh.

3. *Should a child be taught to blow its nose? and should water be snuffed up by it to aid it, or its nose be washed out with a spray daily?*

A child should be taught to blow its nose if done properly, but as the nose-blowing is generally done it is conducive of harm to the middle ear, and is thought by some to greatly increase the chances of earache and running ear. But if the handkerchief is simply placed under the nose and the discharge blown into it, there can only good results follow, viz.: emptying of the respiratory tract of the nose, and the promotion of free nasal respiration,—a very important function. Water should never be snuffed up the nose by children (or adults), except in case of nose-bleed, as it is apt to be painful and also bring about a feeling of fulness in the nose, and thereby increase the obstruction. Water well warmed, and

containing an alkali combined with carbolic acid, may be employed; its value is greatly enhanced by the addition of glycerin.[1] Used in the form of a spray, it can be made quite efficient in dislodging the retained secretion, cleansing and purifying the passages. Unless the discharge is profuse and purulent, a spray of fluid cosmoline can be used to better advantage, often combined with some drug which has a healing action. This simple remedy frequently suffices to effect a cure.

4. *If a child snores, can it be prevented? Is it a sign of catarrh?*

This question may be answered "yes" and "no." If a child snores, this may and often does arise from obstruction to nasal breathing produced by nasal occlusion in various parts of the canals. It also very frequently arises from enlargement of the tonsils,—probably the next most common condition causing mouth-breathing and rendering snoring possible. There are some cases of snoring in children that do *not* arise from any diseased condition of the mucous tract, but appear to come on during profound sleep, such as is often noticed in adults. Snoring in adults, in many cases, does not depend upon any obstruction in the nose or throat; this I have often verified by careful inspection of subjects given to snoring. The prevention of snoring which is dependent upon disease will only be successful by removing the cause,—removal of all obstruction and the cure of mouth-breathing.

5. *Should a child that hawks or snores use douche or spray? If so, how often, and what should be used with it?*

Very young children never *hawk;* the act of swallowing repeatedly or coughing takes the place of hawking, and the secretion in the fauces and post-nasal space is generally swallowed, as in infants. A nasal douche should never be used for a child except in cases of dry or fetid catarrh, when it is of great use in expelling the retained secretion. A douche used

[1] Dobell's solution, with a Davidson atomizer, No. 63.

under any other circumstances as a treatment for children is liable to do much harm to the middle ear and increase the cold in the head. As said before, a spray can be used with advantage, but only as often as is compulsory, say once or twice a day, and even then the mildest solution should be used,—one or two grains to the ounce of boracic acid, chlorate of potassium, in glycerin and water, or, better, benzoin or albolene combined with tar-camphor or menthol. Medication of the nasal chambers can be very efficiently instituted by the use of the "Oliver vaporizer," using fluid cosmoline or glycerin, to which may be added such drugs as are suited to the condition.

6. *Please give all the best methods for stopping nose-bleed.*

Nose-bleeding occurs in the vast majority of cases in children from a superficial ulceration on some portion of the middle line of the nose, just within the opening of the nostril. This abrasion is caused from picking the nose, the finger-nail or handkerchief scraping off the outer layer of the mucous membrane. This superficial ulcer on the middle line remains unhealed for a long time, by reason of the free motion in the parts in blowing the nose, together with the low vitality of this thin mucous membrane covering the cartilage. Aside from injuries (falls, blows, and sharp substances thrust up the nostrils), the ulcer is the source of most of the nose-bleeds. Blowing the nose and wiping it with too much vigor, attacks of sneezing, cough, etc., also bring about the flow. Remembering that the seat of the bleeding is very low down in the nostril, and not high up, as is generally supposed, the ease with which the hemorrhage can be arrested by a little pressure will add greatly to the prompt and successful treatment of these attacks. The finger (if the child's nostril is sufficiently large) can be introduced and pressed up against the middle line of the nose for a sufficient length of time to stop the bleeding. Then, carefully withdrawing the finger and prohibiting blowing of the nose will often be sufficient. If the opening of the nostril is too small to allow the finger to be

introduced, enough cotton, wool, or soft sponge can be pushed into the orifice to slightly distend the nostril, and pressure made against the outside of the nostril with the finger. If kept up long enough this will often succeed. If the bleeding has been great, or long continued, saturating the cotton with some astringent, such as a *weak* solution of alum, tannin, or tincture of iron, will cause arrest of the bleeding much more promptly. Probably the most satisfactory astringent to use on cotton is the watery extract of witch-hazel, familiarly known as "Pond's extract." Saturating the piece of absorbent cotton or sponge and squeezing out about one-half, then introducing into the nostril, will be immediately successful. If there should be too much nervousness to try the introduction of any of these substances, a simpler plan is to apply ice or iced water to the nose, forehead, or back of neck at short intervals. Cold water snuffed up gently will often arrest the hemorrhage, or, if the child is too young to snuff up fluid, it can be squirted up the nostril with a small syringe. If urgent, extract of witch-hazel had better be used, and it will be with the happiest effect. It can be used full strength, but is painful, and had better be diluted with water, one-half or two-thirds in very young children, and in proportion in older ones. The witch-hazel is in most cases entirely satisfactory, but if, after all these methods have been tried, the bleeding continues, a surgeon must be called and the nostrils plugged more perfectly. The position generally assumed in nose bleed—that of holding the head downward over some vessel—is a very bad one and should be avoided. The head should be held more erect, and the blood allowed to flow into a towel, handkerchief, sponge, or absorbent cotton. To make a permanent cure, the ulcer—the cause of the bleeding—must be removed. This will have to be done by one sufficiently skilled to examine the nose carefully and treat the parts intelligently. The ulcer is often slow in getting well unless carefully managed. If the nose-bleeding arises from some other cause, or during an attack of acute illness, the nose should be promptly examined with a good

light and the cause discovered and removed by the surgeon. At times, in children of plethoric habit, a small bleeding at the nose need not make the parent feel at all anxious, but it may be looked upon as simply an attempt of nature to get rid of too much pressure in the blood-vessels.

CHAPTER XLVII.

DISEASES OF THE EYE.[1]

To the laity, almost all inflammations of the eyes of new-born babes are known as "*ophthalmia;*" but we want to specify and say that physicians, in a general way, recognize two forms. One caused by cold—the harmless variety—can be easily cured by careful cleansing and the use of astringent washes, such as rose-water or alum or borax (one grain to one ounce of water). The other, a most dangerous and easily-contracted disease, threatens blindness. This latter form is not apt to spread among careful people, at their homes, but at public institutions, unless isolated at once, will be sure to sweep through and attack every child.

Just here we want to call the attention of those interested in "Day Nurseries" where frequently enough care is not exercised. No child with a suspicion of "sore eyes" should be admitted, whatever be the excuse, for physician and management alike are morally and legally responsible for eyes lost, even though their work be purely one of charity.

If asked how a baby's eyes should be treated immediately after birth, we would say, certainly *not* to a dose of soapsuds in the—to be condemned—popular primary scrubbing with which many a poor babe is tortured. The bad colds (snuffles)

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[1] For this chapter we are indebted to Dr. Charles S. Turnbull, of Philadelphia.

which attack such over-scrubbed babies affect the eyes, as well as the nose and throat, and often alarm the medical attendant and worry the mother and nurse.

If, as in such cases, the eye looks red and the secretion be gummy and sticky, like the white of an egg, or if a yellowish-white discharge be present, gathering in the corner of the eye, or perhaps gumming the lids together, we have a simple (benign) case of inflammation (conjunctivitis), and a soothing eye-wash, composed of

Borax, five grains;
Paregoric, one teaspoonful;
Infusion of sassafras pith, eight tablespoonfuls,

should be frequently applied with a pledget of absorbent cotton, and about twice, early in the day, a few drops may be allowed to run between the open lids.

Should, however, the eyelids, within the first twenty-four hours, puff up and swell, so that the eye cannot be opened, and particularly should the secretion oozing from between the lids be creamy and of a yellowish, pinkish, or greenish color, then look out; the dread ophthalmia has started.[1]

Ophthalmia of the new-born is the disease which contributes so largely to the causes of blindness in our asylums, and calls for the most heroic treatment on the part of the medical attendant, and eternal vigilance on the part of the nurse. At this juncture both physician and nurse must incessantly and

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[1] Our first anxiety must be for the full dilatation of the pupils, and to this end the doctor will use one drop of the "atropine solution," put into the eye (at its outer angle) twice each day.

Atropine, one grain;
Water (boiled), two teaspoonfuls.

The bottle containing these drops should be marked "*Poison*," and must be kept under lock and key. If after the instillation of one drop of the atropine solution the baby's skin should become red, and look as if it had scarlet fever, it has been poisoned (harmlessly); but do not put another drop into the eyes until you have talked with your doctor.

conservatively, yet resolutely, attack the disease, and unceasingly fight night and day.

The swelling and inflammation must be combated by cold applications, day and night, made by means of small pledgets of linen, which are lifted cold and wet from a block of ice and laid upon the eye; but be careful that they cover no more than the burning eyelids. These pledgets will be required to be renewed frequently, at intervals of from fifteen to twenty minutes. The lids, at the same time, must be gently separated, and the discharge allowed to escape, or be carefully wiped away with pieces of absorbent cotton, dipped in fresh water or salt, borax, or corrosive sublimate (one to ten thousand), to make a weak solution.[1]

Use vaseline to anoint the eyelids, cheeks, and to grease the eyelashes (cilia), to prevent their sticking together from secretion, which must always be encouraged to escape.

Sponges are dangerous. Never use them. Use absorbent cotton or "lintine," as it is clean and can easily be disposed of. Burn it.

Great care must be exercised that the cold applications be not kept up too long at one time,—*i.e.*, without intervals of a few minutes' rest, say fifteen minutes every two hours. They have *only to be continued until the swelling of the lids and the*

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[1] The doctor should, in the absence of the apothecary, be willing to personally supervise the daily preparation of a peculiar sort of "*antiseptic wash*," to which we wish to call particular attention, which we have been using for some years with unusual success in the treatment of purulent ophthalmia of the new-born. We find this wash invaluable in every case of specific ophthalmia. It is in reality a "mercurial wash" equal to about one to four thousand; nevertheless, we invariably insist upon the solution being made up according to the following formula:

Red oxide of mercury (hydrarg. biniodi. rub.), one grain;
Iodide of potassium, two grains;
Water (boiled), eight ounces.

To be used with a pledget of absorbent cotton or in irrigating the eye with a pipette.

profuse creamy discharge have disappeared. Be careful also about the ears, and see that no water trickles into them; also see that the hair be kept dry, and the pillow as well; and be most particular that the patient's and attendant's hands are kept clean and never put near the face, for fear of inoculation, always regarding the discharge and every sort of eye-wash used as rank poison.

So long as the discharge be creamy, it must be considered as corrosive in its effects upon the eyes (like acid or vitriol), and it is during the first stage, when the swelling is so great that the lids cannot be opened, that the following "anodyne wash," to be repeated (instead of the mercurial wash) every three hours, must be gently squirted (with a round-end medicine-dropper) from the inner (nasal) angle of the fissure between the eyelids,—

Sulphate of morphine, two grains;
Chloride of zinc, two grains;
Rose-water, ten drops;
Distilled water, five tablespoonfuls.

Now recollect, such eyes cannot be watched and cleansed and treated up to bedtime and then neglected because the baby or its attendants sleep. Oh no! Lest the little one's eyes melt away during the night. Long naps are not desirable neither for the children nor the nurse, as "a good night's rest" has cost many an eye. We repeat, *the treatment must be kept up night and day.* We have said the secretion is corrosive in its action upon the structures of the child's eyes, and as the eyeball, from pressure of swelling, is damaged, the discharge is doubly dangerous. Then, too, the child might turn on one side in its bed, and the discharge, by gravity, would run into and inoculate the fellow-eye. This is not all; it is deadly poison when transplanted to any other person's eye, and nurses, mothers, and medical attendants cannot be too careful. Even the poor laundress often becomes a victim, and this poison has too often been the cause of the loss of valuable

eyes, to which, through ignorance or carelessness, it has, by touch only, been conveyed. Keep the poor little one's excoriated cheeks and skin, rubbed raw by washing, we repeat, well anointed with vaseline; so also the edges of the eyelids, nose, and nostrils. Keep pledgets of cotton (not absorbent cotton) in the ears. Keep the patient's strength up by extra and tempting diet, and give the usual fever mixtures,—"sweet spirits of nitre," quinine, and, perhaps, anodynes.

The baby's sleep will be greatly disturbed, its nervous system racked; it may take cold, it may become sick, it may die from irritation and exposure. Take the risk, and if you falter in accepting the odds, think of the heart-rending appeal of a pair of sightless orbs. Think that the flaxen-haired girl might be a "blind Nydia," or the boy a dependent, helpless man. We are emphatic, because we have seen the deplorable ravages of the disease we have but partially described: so we urgently warn you to immediately care for it, and promptly seek counsel and experience to fight this dreadful disease. It blinds other individuals in families; it blinds children in our asylums, and two or three at a time; it blinds grand nurses, loving, faithful Sisters of Charity, and even prominent and skilful physicians.

Unless a physician be at hand to apply *local caustic* remedies himself, *we consider it criminal* to recommend such, or, even worse, to *order caustic solutions to be dropped into the eyes.* The physician only must turn the lids, brush over any caustic solution necessary, and immediately (for fear of over-effect or damage to cornea) wash it off again; but stronger applications than those we have named must not be permitted for home use.

We have only referred to the treatment of individual cases at home. In asylums, where infants are brought in daily, we insist upon immediate isolation of the child as well as its attendants and their wash.

If this disease in any case be progressing to a favorable termination, the discharge will become less, the swelling of the

eyelids will diminish, and the child will be able to open its eyes. At this stage we commence the use of a slightly-stimulating salve,—

> Yellow oxide of mercury, one grain;
> Vaseline, three drachms,—

to be rubbed on the edges of the eyelids about three or four times a day, or just before the babe goes to sleep. Beyond this we cannot advise any other treatment save that which your medical attendant may order.

We would with this disorder make an exception, and say that without medical advice and guidance "ophthalmia in the new-born" must, as a rule, mean blindness, whether of one or both eyes. In the contagious ophthalmia of asylums, where one sore-eyed baby poisons the rest, and where simple yet decided local treatment is required, we particularly commend a peculiar compound called fifty-per-cent. "boro-glyceride." This is made by boiling together boric acid and glycerin—sixty-two parts of the former to ninety parts of the latter—until the product loses weight and weighs but one hundred parts. This, on cooling, resembles in consistency and appearance ice or "glacial phosphoric acid," and is found to be very hygroscopic. To dilute it, glycerin must be employed; and the best method for its preparation is, when freshly made, to add to it glycerin in such proportion as to make a fifty-per-cent. solution. This makes a preparation of the consistency of honey, to which can be added iodine, tannin, resorcin, carbolic acid, iodoform, morphine, atropine, eserine, etc., as may be desired.

Ointment of boro-glyceride is made after the following formula:

> Solution of boro-glyceride, fifty per cent., two drachms;
> Vaseline, six drachms;
> Oil of rose, a drop or two. Make an ointment.

This makes a thoroughly stable ointment, which neither becomes granular nor precipitates the boric acid. We feel

confident that in this compound we have a most valuable remedy, and when called upon to combat the appalling epidemic, such as so often occurs in our asylums, we feel much more secure—especially in the case of young children—when using this excellent remedy. The fifty-per-cent. solution of boro glyceride, on account of its great affinity for water, and the rapidity with which it absorbs it and liberates the finely-divided particles of boric acid, not only acts as an astringent but also as an antiseptic. We believe that it is just the substance that we are in need of for the treatment of all forms of chronic inflammation of the eyelids, especially "*contagious or asylum ophthalmia.*"

The use of the ointment mentioned we consider an essential part of the "boro-glyceride treatment," and it must be continued for at least two months after all discharge has ceased.

This disease, like every form of ophthalmia, is only transmitted by inoculation, and under proper care need not be transmitted even to the fellow-eye.

What is proper care? Proper care is such as can only be secured by two skilled and trusty nurses,—the one for the day, the other for the night,—who are never to leave the patient alone; or, as an extra precaution, better say four attendants, so that one of the two on duty will be sure to keep awake.

As soon as the little sufferer shows the least tendency to open its eyes, it should be encouraged in its endeavors. Darken the room moderately, so that the influence of the bright light does not cause spasmodic closure of the eyelids. The opening of the eye is beneficial in two ways,—the movements of the lids work the corrosive secretion out from between the eyelids and stimulate the circulation in the affected parts.

When a child opens its eyes the danger is generally over, only we must not relax our vigilance, for a relapse must not be allowed to occur. The ice applications, we repeat for emphasis, have only to be continued until the swelling of the lids and the profuse creamy character of the discharge have disappeared. No child need lose its eyes from purulent oph-

thalmia, and no child does, if faithfully treated in the way just described.

Dr. H. Knapp says he is convinced that nothing is so powerful in diminishing the violence of this dreadful inflammation as cold, and he is afraid that warmth may temporarily increase it, and favor destruction of the eye; and says, furthermore, "among all questions in ophthalmology,—that of cataract, perhaps, excepted,—there is none so important as the treatment of contagious ophthalmia."

Spots like pimples (called pustules) are often seen *on the eyes* of children *during warm weather*, especially troubling those suffering from disordered digestion. These pustules may come on the clear part of the eye (cornea), or upon the white or pink part of the ball of the eye (conjunctiva). They are painful, and cause profuse watering of the eye (lachrymation) and dread of the light (photophobia). The child usually burrows its head into the nurse's shoulder, its pillow, or a chair or sofa cushion, and being fretful and wofully unhappy and uncomfortable, becomes a frightful (no other word expresses it) care to both nurse and mother. With its head burrowed into a pillow, especially a feather one, it is in the condition of a child with a poultice to both eyes. The tears wet the pillow, the face keeps it warm, and hourly the eyes grow worse. Such cases must be cared for at once, as the affection lasts from weeks to months, and even years, wrecking the health of both the child and its attendant. By force or persuasion *the little one must be kept on its back when in bed* in a darkened room. Use a hair pillow.

The successful *treatment* of such cases depends upon our ability to be particularly attentive to hygiene and diet. *Regularity of feeding* (meals), the *omission of all forms of starchy and sweet foods*, selecting milk, soft-boiled eggs, rare meat, broth, and if it must be, stale (baker's) bread. *A sponge-bath each morning* we urge as an essential in the treatment of "phlyctenular ophthalmia" (keratitis or conjunctivitis), as the doctors call it. This sponge-bath we order for children over two years

of age, to be given each morning. Sponge quickly with warm or even hot water, and immediately follow with cold water; such cold water as would be about the temperature of ordinary apartments,—*i.e.*, 65° to 70° F.

Indiscretion in diet is apt to cause a recurrence of the trouble, which as a relapse will always be more severe than the primary attack. We formerly used atropine (belladonna) to dilate the pupils in such cases, but now we use eserine (Calabar bean) *to contract the pupils.* By this means we secure a beneficial effect locally, by making the pupil smaller, and mechanically keep out the light, which is painfully irritating and annoying. The solution we recommend is,—

Salicylate of eserine, one-half grain;
Water (boiled), two drachms.

Mark "*Poison.*" Put one drop into the eyes two or three times a day. (Druggists must dispense this solution in dark glass or paper-covered bottles.)

Keep the apartments well ventilated but darkened, hence cooler, and *take the child out at night*, say between sunset and bed-time (10 P.M.). Do not be anxious for fear it may "take cold." *Air from fresh water*, such as we secure on lake or river (ferry-boat), is especially good. A sun-bonnet is the proper "head-gear" for children with irritable eyes, be they caused by this or any other inflammatory trouble. Make the sun-bonnet out of "wash goods," with casings into which to slip, in and out, strips of card or pasteboard, which will give the bonnet stiffness. These strips of pasteboard can be removed when the bonnet is washed, and easily replaced. Starched bonnets will not answer for children who use them as eye-shades, as the stiffness will not last any time.

Permit us in this connection to recommend *woven-wire* or *hair pillows*, or, still better, a combination of both, which can be had in this city; and for baby beds and pillows we cordially endorse this innovation. Note how infants and children perspire when sleeping, and how hot they seem about their heads,

and try hair or wire mattress and pillows, and you will have the great satisfaction of making the little ones both comfortable and more healthy.

For burns of the eye, drop into the eye clean sweet castor oil,—if by mistake anything has been dropped into the eye, like ammonia or other caustic, or it may be, spilled hot water or tea, or even whitewash, etc., after cleansing as thoroughly as possible.

Stoppage of the tear-duct (occlusion) accompanying nasal trouble may be temporary, and soon disappear after the use of a wash of powdered borax and water (a pinch to a wineglass of water), always remembering to anoint the inside of the nostrils with cosmoline or other grease. Continued occlusion may cause *abscess of the tear-sac* at the inner corner of the eye, alongside of the nose. This must have the surgeon's *immediate* attention.

Wounds of the eye, either *incised* and from pieces of flying glass, scissor-points, or fork-tines; *cuts* or *tears* from flying fragments of stone or metal, or *impinged* pieces of stick or wire, *must not be meddled with. Better not bandage*, but devote every effort to keep the child's hand away from its eye. If the doctor cannot be seen within a few hours, ask your druggist for the proper solution of atropine (belladonna), and put one or two drops between the lids.

In every case, better omit any interference with an injured eye than fight your little patient.

The rule to-day is not to confine, by tying up or bandaging, all operated eyes; hence the advisability of following the above rule.

Bleeding (*hemorrhage*) *from the eye usually means a damaged eyelid;* seldom is it that the *eye* bleeds. *Injuries* involving the edges *of the eyelid* call for *careful adaptation* of the parts, and, if at all possible, the parts must be carefully stitched. If such damaged lids are left to heal, Nature, strange to say, seems to forget herself, and the scar produces a marked deformity, and when the lashes are, by malposition, turned in upon the eye,

great damage to the member usually results, to say nothing of the discomfort from the scratching of the misplaced eyelashes. Where the cut has at the same time so damaged an eye as to cause its contents to "run out," great pain, usually absent in other grave injuries, will call for *absolute rest* and a soft cotton pledget to close the lids of both eyes; this pledget to be held in place by a light cheese-cloth bandage until you can hunt up your doctor.

Close both eyes if you would keep one eye at rest.

Squint, or *cross-eye*, makes its appearance at any time after the fourth or sixth month. Just as soon as the baby uses one or both eyes the defect should be looked after, because if taken in time but few cases ever come to operation, and in some instances not even glasses will be required. We venture in a general way to promise parents who heed this warning immunity from the annoyance of squinting children.

Paralysis of the upper eyelid, usually congenital, involving one, seldom both lids, must not be allowed to remain uninterfered with, because by covering the eye, squinting and loss of vision are induced (cross eye), and the child's head is given a most unnatural position. The head is constantly tilted backward. Such cases require the surgeon's attention after *massage* has been given a thorough trial.

Instinct teaches a child to *rub its eyes with its fist.* Would that adults would take heed and do the same, and so save themselves from infection from "dirty fingers."

Provide your children with broad-brimmed hats or sun-bonnets *for protection* against the strong sunlight of summer-time, and shade the eyes of the babies, as they lie upon their backs in their baby-coaches.

Forget about the "alum-curd" and piece of raw beef as an eye-poultice. *Milk of any sort* must not be used as an application for the eyes. All these substances are poisonously dangerous.

Always put your baby to sleep in the dark, and when it awakens admit the light gradually. Do not forget and rush with it into a brilliantly-lighted apartment.

No child should go to school before the seventh year.

Modern "kindergarten" systems, as a rule, develop eye-defects, and, in our opinion, damage children's eyesight.

CHAPTER XLVIII.

DISEASES OF THE EAR.[1]

The symptoms of *earache in a babe* are so vague as at first not to be distinguishable from other forms of irritation. Except slight fever, more or less restlessness, rolling of the head from side to side, perhaps backward burrowing into the pillow, nothing is noticed until the attendant reports a "running ear." The drum or middle ear fills with a watery-like fluid (the watery part of the blood, serum), or it may look like pure blood, which fluid, by pressure, causes more or less severe pain, and subsequently breaks through the drum-membrane and escapes from the ear. Often the perforation closes over night, and apart from the coating of the auditory canal with a whitish residue from the serum, or staining of the external ear from blood, nothing is noticed. The perforation, however, does not always heal. It may remain open for some time,—this being apt to occur in weak or strumous children. In some cases it never closes nor does it materially interfere with hearing-power.

Discharges from the ear—caused by "taking cold"—behave like, and may be compared to, the discharge from the nostrils under similar circumstances. The secretion is first watery, then thin mucus, followed by thicker stringy or tough mucus, then by "matter" (pus), and last of all badly-smelling matter (fetid discharge). Discharges from the ear should only be

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[1] For this chapter we are indebted to Dr. Charles S. Turnbull, of Philadelphia.

carefully wiped out with plain absorbent or, better, sublimated or borated (the so-called "medicated") cotton. Do not on any account allow rags or a pocket-handkerchief to be used for cleansing purposes, nor use cotton to plug the ear. When the discharge is offensive there is danger ahead, and if the doctor has not been called, now is the time.

If a babe seem to have earache, until competent advice is at hand, *have resort to the hot foot-bath*, and use dry heat to the ear,—the "hot-water bag" or hot salt in a flannel bag; never forgetting, when the pain is not relieved, paregoric, which drug, properly labelled and directions carefully read, will stand you in good stead. Further than this, your doctor must prescribe all necessary medicines.

We strenuously object to the use of drops of any kind. Water or other fluids must not be dropped or syringed into the ear. Fluid so used makes a subsequent ocular examination of the ear quite impossible on the part of the doctor, and syringing with water macerates the parts and retards the subsequent healing process. Healthy babes' "running" ears always get well if they are kept clean, as directed, and not *meddled* with: so recollect that sins against the ears of children are more usually those of commission than of omission.

Soap and water we consider *poisonous to the ear*, and the picture, familiar to almost every one, usually accompanying advertisements of soap, shows the grandmother washing her boy's ears with soap. It may have been the way "in the olden time," but the expression of the boy's face goes to show that nature would teach him to protest, if he dared; now we are pleading his cause and begging mothers not to allow soap and water to be used. Children naturally rebel, and interference with their ears is generally a cause of war in the nursery; and it is just here we wish to put in a plea for the juveniles, and condemn the usual practices of the best-intentioned mothers and nurses.

In *cleansing discharging* ears, or attempting to thoroughly free the auditory canal, never swab it out, but use fluffy

pledgets of absorbent cotton gently pushed into the meatus, carefully agitate with the little finger, and so long as the discharge can be wiped out continue to use pledget after pledget. *Never use anything smaller than the little finger*, to force cotton, *in wiping the auditory canal.* Deeper wiping is forbidden in the case of children: the innermost parts will not suffer. In adults, where the secretion mechanically interferes with hearing, other methods may be employed. In larger children or adults Valsalva's experiment may be employed. This procedure, which the aurists term "*auto-inflation*," is accomplished by shutting the mouth firmly, holding the nose tightly, and blowing with one's "might and main," so that the air, not being able to escape through the mouth and nose, must be forced up through the Eustachian tube, out of the middle ear through the perforation and into the auditory canal, taking with it all the secretion which may block the way.

In *syringing ears*, except for collections of wax or of foreign bodies, there is danger, especially in children, from impure water and varying temperature. The auditory canal, in children, is particularly short, and another source of danger is the susceptibility of the parts, from anatomical relations; particularly, contiguity of the brain.

Most discharges from the ear, in our opinion, unless they be sour or fetid, strange as it may seem, must be regarded as *harmless* in so far as hearing is concerned, provided there has been no *meddling*, no water used, and the general directions just given have been carefully followed.

Now, how can this all-important process be accomplished in the case of children? In only one way,—by forcible inflation, or by having them blow their noses. *Every child should be taught to blow its nose.* If it has not been taught to free the nostrils of mucus, its chances of retaining hearing-power in cases of disease of the ear are much poorer than in the case of one who has learned to blow its nose. In using the word child in this connection, we refer to those between four and twelve years of age. Younger than four need no such meddle-

some interference; older than twelve are more amenable to treatment, as a rule, than adults.

Our method of inflating the middle ear for children of tender years carries with it no alarm, and it is rather the rule than the exception for us "to have a good time of it" together. First, induce the little one to blow, as if blowing out a light (and if necessary strike a match and show it how to blow it out). Having won the child's confidence, place one end of an ordinary otoscope (substantial piece of black rubber, one-sixteenth-inch hosing, about two feet long) in the nostril of the side to be treated and with the other end in your mouth, having taken the precaution to close the child's other nostril, give a gentle blow or puff to show the child what you propose doing. As the child blows we puff a little harder, and as we grow enthusiastic over the sport our little one blows vigorously, and we give a forcible simultaneous blow which forces the air up the Eustachian tube into the middle ear. In nine cases out of ten children clap their hands to the ears and say they have heard the air enter.

Win the confidence of the little ones by patience, gentleness, and tact, and their treatment will be an oasis in the day's practice among adults.

Because we advocate the educating of all children in the art of blowing their noses, we wish it to be distinctly understood that, as a habit, we would condemn it. Children left to themselves, except for the habit of mimicry, would never think of blowing their noses. Our practice, be it in the private office. hospital, or dispensary, is, as a rule, confined to those children carrying handkerchiefs, which from time to time are more or less vigorously used. Such blowers, as a rule, are our patients for running ears. Those who sniffle all day long, unpleasant as it may sound, or wipe their noses—dreadful as it may seem—on their dress-sleeves, seldom, if ever, are annoyed with running ears.

Allow us to score a point in this connection. When a child suffers with ordinary influenza, "a cold in the head," allow it

to sniffle, nay, urge it to do so (and the same is the case in adults), and take our word for it, the duration of the attack—although made, if possible, more annoying—will be greatly shortened; the watery secretions will give way to a thick jelly-like collection which will soon change to the natural mucus of the parts, and all of a sudden the "cold" will disappear, leaving no unpleasant symptoms such as usually follow in the cases of those who have not moral courage enough to refrain from blowing their noses.

The great secret in the successful treatment of all discharges from the ears is the recognition of the fact that, so long as the discharge is not allowed to ferment, it will not become fetid, seldom ever purulent.

As soon as the discharge from the ear makes its appearance, something is invariably dropped into it, or, in conformity with custom, it must be "syringed out." Nothing is more damaging to the successful termination of such cases. We would not complain if *pure* warm water were used to syringe the ear, or, still better, if a salty or alkaline solution were used, but the "Castile soap" is invariably added. Perhaps warm milk may be used. The soapsuds make an irritating solution, the milk one that rapidly ferments and becomes acid, so that the auditory canal—it may be a warm cavity filled with simple mucus or perhaps serum—is converted into one that is inflamed and filled with a fermenting fluid. What next is done? A fluffy piece of cotton is rolled into a dense mass and stuffed into the ear. The sour, fermenting, perhaps fetid mass, now corked up, fairly boils, and, where a harmless inflammation was in existence, an active and dangerous one has certainly been started.

To remedy affections of the ear general surgery has done but little; in most instances medical men are glad to get rid of "patients with running ears;" and this, added to the prejudices in the minds of the community at large, and in some of the profession, too, after the injurious effect of healing or "drying up," as it is termed, discharges from the ear, has caused this affection, through ignorance or apathy, to be much neglected.

We cannot, in this connection, omit a quotation from Saunders[1] (A.D. *1806!*). He tersely ventures a question or two concerning those prejudices which even to-day, alas! are urged against the cure of running ears.

"What argument can be assigned against the cure of this disease that is not equally conclusive against all others? Is any one an abetter of the obsolete humoral pathology? He will contend that the stoppage of a drain which nature has established is pernicious, and the morbid matter will be determined on the internal part; but how can such person venture on the treatment of any disease, even the healing of a common ulcer? Some years ago I thought this absurd doctrine had been totally exploded, and yet I constantly hear it adduced to deter parties from interfering with this disease. Is a child subject to it, some other subterfuge, equally futile, is employed. The truth is, the disease is always tedious and difficult, and *not* always curable, and many are disinclined to embarrass themselves with the case who have not the candor to make the true statement."

We have often been met with the objection,—and we must confess it is generally well put,—"Why dry up the discharge from the ear, since, when suppuration is actually taking place, patients, as a rule, hear better?" True enough, as the discharge ceases in the case of a running ear, hearing-power is usually materially diminished; but we always make the reply by asking the question, "Which is better, half a loaf or no loaf?" That is, had we not better stop the discharge and save some hearing *which will be permanent*, or allow the discharge to continue and destroy the parts, and in greater or less time lose all hearing? Then, too, if only for the abolition of the disgusting fetor which accompanies such cases, if for nothing else, it is well worth while risking any fancied extension of the inflammatory process. Children with "running ears" are tabooed by their school- and play-mates. So, like adults,

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[1] John C. Saunders, M.D., The Anatomy of the Human Ear, etc.

they are tolerated, while, self-conscious of the sickening odor from their ears, they shun society and companions, and imagine, not without good cause, that every one is aware of their infirmity. The majority of such patients are generally willing to forego the greater or less amount of loss of hearing-power,—usually temporary,—if the offensive discharge can be prevented.

Beyond a doubt *a discharging ear is "a thorn in the flesh." It must be removed in the shortest possible time.* Apart from the risk of damage likely to occur from a chronic discharge from the ear, the hearing and subsequent happiness of the individual is undoubtedly compromised, to say nothing of the unfortunate's health. Fetid ear-discharges run down into the throat and poison the system. This is no fancied deduction, but a fact. By simple cleansing of the ears and teaching our patients how, by Valsalva's method, to blow the air and with it the discharge outward from the middle ear into the auditory canal, which we must keep thoroughly cleansed, we have met with most pleasing results in these same children, who, from pale and emaciated subjects, have grown to be fat and ruddy specimens of humanity.

Again, we are often confronted with the objection that "If the discharges from the ear should be stopped the disease will go to the brain." How did this idea originate? Because heretofore such heroic measures were used to check the discharge, because into the ears such caustic solutions were poured, and powders were insufflated; furthermore, because no intelligent treatment was employed. In the majority of cases no regular ocular inspection of the parts was ever made, and extension of inflammation and disease to the inner ear, or even brain, resulted.

The majority of cases of running ears in children under two years of age would recover, and the hearing would not be damaged, if they were simply let alone.

Now this statement may seem startling, but it is nevertheless true. Ordinary cleanliness is all that is necessary for the proper management of such cases. In the use of medicated

solutions to be dropped into the ears of children, the anatomy of the parts must be understood. The auditory canal is short and the Eustachian tubes are patulous, and solutions dropped into such ears of children run directly into the throat. For this reason, if for no other, the syringe should not be used.

Admitted that nothing but pure water has been used, even this is too irritating for the ear, Eustachian tubes, and fauces, for it must not be forgotten that the mucous membrane or lining of the drum or middle ear serves the purpose of the periosteum, the same membrane that covers and nourishes the bone. Those who have accidentally gotten water up the nose will recall its unpleasant irritating effect.

After scarlet fever, measles, diphtheria, whooping-cough, chicken-pox, bronchitis, etc., dentition (cutting teeth) is the most fruitful source of running ears, and the tendency of all such cases is to recover without damage to hearing, provided they be kept clean and nature be given a chance.

How should the ears be kept clean?

We want to impress upon parents, and those who are to advise them, the necessity of using the utmost care in the art of cleansing the ears of children. Wax (cerumen), with which nature has furnished the auditory canal, is usually swabbed out weekly, if not oftener, with the twisted corner of a towel, handkerchief, or wash-rag soaked with water or soapsuds; and more frequently than is supposed a pin or hair-pin is called into requisition. By these means the wax is pushed in and well rammed down layer after layer, and at each washing a layer of desquamating epidermis is added (as cow's hair is to the mortar), and this serves to bind the mass together and make its removal more difficult. Water and wax will not mix.

Masses of wax or dried skin—in fact, all sorts of foreign substances, pushed into the ear by unsuccessful attempts at cleansing with the wash-rag, etc., or foreign bodies designedly placed in the ears by children—is often the cause of a most distressing cough, for which the little patient is mercilessly dosed. "*Ear-cough*," to the experienced, is quickly recognized

as peculiar and spasmodic, and observant children often complain of a tickling or irritation in the throat, just below and behind the angles of the jaw, which symptom—and perhaps accompanying deafness—must point to the ear as a cause.

Impacted wax, with but few exceptions, is found only in the ears of those who have had water, soap and water, or wet cloths used to cleanse their ears from what is usually called "dirt," and what we must recognize as absolutely essential to perfect hearing and a healthy condition of the ears. Such masses must be first soaked by the instillation of a warm alkaline solution (baking soda, one teaspoonful to one teacupful of warm water); these can always be safely removed by syringing with warm water, which procedure is the only one in which we consider the use of water permissible; even here, however, had water not been injudiciously used in the first place the wax would never have become packed.

In case it becomes necessary, on account of superfluous wax or the lodgement of dust, to wipe out the auditory meatus, it should be done with a damp towel, or a dry soft cloth, preferably a soft greasy rag. We prefer to allow the children to manipulate the greasy rag, as the size of their fingers just suits their ears.

About Foreign Bodies in the Ear.—Children seem especially possessed with a mania for placing buttons, beads, seeds, pebbles, etc., into their ears, and the majority of doctors are prone to attempt to spoon, gouge, or dig them out. Whosoever attempts the removal of any foreign body from the ear of a child by any other means than the syringe and warm water, and, if the child be frightened, without the use of an anæsthetic, certainly shows great want of experience or heed to the warning of those who are able to advise.

For *living insects in the ear pour in oil*, or even water. Preferably oil, even "kerosene." Drown first and subsequently remove by syringing.

Now that we have the petroleum products,—vaseline, cosmoline, and fluid cosmoline,—all of which have the charming

recommendation of never fermenting, we never order anything else to be dropped into the ear; other oils usually distilled must be omitted, because such vegetable products as olive and almond oils act, sooner or later, as irritants.

Except for earache in larger children and adults, we use the following preparation, which we designate "earache drops" (the aromatics contained prevent the small proportion of almond oil from fermenting):

Cocaine muriate, two grains;
"Baume tranquille," three drachms.

Put a few drops into the ear with a glass dropper, previously heated by dipping in hot water.

Babies should always wear an under-flannel cap, and larger children should wear bonnets during the cold weather, which may be made of any warm material to suit the taste. These should tie under the chin and protect the ears. Too frequently warm caps are worn during the week and to school, while on Sunday, as well as on high days and holidays, is substituted a gorgeous hat, which leaves the head and ears unprotected. Especially necessary is a warm cap for a child who has suffered from ear-disease.

On no account should cotton ever be worn in the ears. Why? Because it acts like a cork, prevents the ventilation of the ears, and acts only as an irritant.

A Child with a Running Ear may go out in Cold Weather.—Unless there be actual pain present or commencing inflammation of the ears, a child should be warmly dressed and sent out just as usual. Housing of children with running ears is more apt, by engendering ill health and disordered digestion, to do harm rather than good. If the *feet are kept dry and warm*, fresh dry air is to be especially recommended, with out-door exercise.

Parents cannot be too observant in looking after their children. Apart from the many specific directions given in this book, let us ask you to notice the children when they are sleeping. Is the little one's face in placid repose? *Is the mouth as*

well as the eyes shut?. If the mouth be open and your child not suffering from a recent influenza, it is a "*mouth-breather.*" Why a "mouth-breather?" Because air does not enter the lungs through the upper air-passages. Think of it! If you were to close the child's mouth it would smother. The obstruction to breathing must be in the back of its nose, or perhaps caused by enlarged tonsils just back of the tongue. What harm if it does sleep with its mouth open? First of all, the mouth becomes parched and dry, the teeth and tongue are covered with sordes (dried secretions). The arch of the upper jaw, into which the teeth are set, from pressure of the upper lip of the gaping mouth, is pressed upon and does not develop properly. As a consequence, the several portions of the mouth and nose become deformed, and the results of chronic inflammation of the delicate parts therein contained, by enlargement, induce many forms of disease of the ear. The roof of the mouth becomes vaulted. Notice your child at play, and, unlike its comrades both in repose and action, the mouth is still open. Surely your child's voice has a nasal twang.

It may be that your child has had several falls or suffered a number of injuries to its nose. These in turn will cause mechanical obstruction, and make a "mouth-breather" out of your child.

Some children, if not directly after birth, certainly within six months, give evidence of nasal and post-nasal obstruction, mostly caused by the various forms of adenoid growths which have their origin and spring from the posterior wall of the pharynx (supra-post-nasal space). For such troubles we must invoke the aid of the rhinologist and laryngologist. The "nose-man" it is who must exercise his skill.

After years of experience we are fully satisfied that we are but commencing a new era in the treatment, nay, in fact, the intelligent comprehension, of most of the diseases of the ear. The majority of such cases are not, as is usually erroneously supposed, due to some local cause commonly supposed to have its origin in the throat, and usually explained as an extension

of reflected inflammation from the mucous membrane of the lungs, pharynx, or nose, but are distinctly traceable to an error in the mechanism of the action of the Eustachian tubes and their muscles. *We are anxious to place ourselves on record when we state that eight out of ten cases of aural disease are due to nasal obstructions.* Unless the aurist be skilled in the treatment of diseases of the nose, he might as well give up the successful treatment of diseases of the ear. This is throwing a shell into the camp of the otologist. We throw down the gauntlet. His armamentarium of ten years ago must in great part be laid aside. About half the instruments used *but five years ago* may be put on the shelf with such curios as the bivalve aural speculum, Eustachian bougie, etc. We have but to study the function of the Eustachian tube, have in mind its condition during the act of deglutition, and critically note the effect that mechanical opening or closing of the nostrils will have upon the membrana tympani, and in turn the ossicles,—in short, the middle ear (tympanum),—and note for ourselves the peculiar feeling induced in our perfect ears. Just by way of experiment, kind reader, hold your nose closed and swallow! How do your ears feel?

We have had particular reference to diseases of the ear in infants and children, finding it impossible, in passing, to neglect the adult, and have confined ourselves to the study of the practical, common-sense treatment, such as hygiene and our experience lead us to commend.

In conclusion allow us to say that, in prescribing for the ear, entirely too much guesswork is indulged in, and by waiting too much precious time is lost. Do not be hoodwinked when a sage tells you that a child will "*outgrow*" deafness or a discharging ear. It is recklessness—and this is putting it very mildly—for any one to prescribe for an ear without having first made a careful ocular examination of it, and those who order anything to be dropped into the ear, or order an ear to be syringed before making an ocular examination, you may depend upon it, are not to be trusted.

CHAPTER XLIX.

DISEASES OF THE THROAT AND AIR-PASSAGES.

THE diseases which probably cause the most alarm among mothers, and justly so, are those which affect the throat; especially when there is the slightest possibility of the disorder being either diphtheria or membranous croup. We propose to give in as simple language as possible, so that it can be readily understood, a description of these various acute diseases of the throat in children, not for the purpose of enabling the mother or nurse to make a diagnosis,—that is not her business,—but simply to enable her to carry out thoroughly, conscientiously, and intelligently the nursing which forms so important a part in the treatment of these diseases. Undoubtedly, in times gone by, children suffered very much more from croup than they do at present. The change in this respect has been brought about by the doing away with the short-sleeved and low-necked dresses of children, and the thorough understanding of the fact that in a climate as changeable as ours the whole surface of the body, from the neck to the feet, should be protected from the sudden chilling of the surface by wearing a garment, be it ever so thin, of either wool, or wool and silk mixed, the year round.

We hear a great deal of diphtheria, and it is well for us to understand what is meant by this term. The word has been applied to a disease which is characterized by a deposit upon the throat, and, consequently, every time a deposit is noticed upon a child's throat it is at once thought to be diphtheria. The uneducated but avaricious (so-called) "doctor" applies the term *diphtheritic* to all mild and readily-curable affections of the throat, to his advantage. What really constitutes this dreaded disease is a profound constitutional poisoning, caused by exposure to sewer-air, polluted water or milk, exposure from

contagion of the same disease, by which the system is profoundly poisoned with the local trouble, manifesting itself in the throat, larynx, or air-passages. A child may have diphtheria without any appearance of membrane in its throat; then again deposits may be found on the tonsils, as in quinsy, which is not diphtheria at all; but, for the sake of caution, children affected with sore throats should be isolated until seen by the doctor. Those who are well should not use the same spoon or drinking-cup as those that are ailing; this applies to adults as well as to children.

There are mild forms of diphtheria, affecting adults, during which the constitution is not sufficiently affected to prevent their going about their daily avocations, and such individuals are beyond a doubt the means of carrying contagion to those with whom their breath comes in contact. *There is no doubt but that many times diphtheria, and other diseases even worse, are carried to children by the foolish and useless practice of kissing to which the poor little ones are subjected.* It seems strange that a child who will be protected most energetically from draughts, from every form of open contamination, will be permitted to come in direct contact—the most thorough means of propagating contagion—with diphtheria, whooping-cough, scarlet fever, and worse, *by kissing.* We dwell upon this, because we feel that parents should instruct their nurses to prohibit children being kissed by other children and by strangers.

A sore throat should always be looked upon with suspicion in a child, and carefully treated; and especially if the child's neck is swollen on the outside, the glands enlarged, should there be a coated tongue, offensive breath, and great prostration. No one should attempt to treat a case of this kind without immediately consulting the doctor; it is a recognized fact that should by chance the little patient have been exposed to sewer-air from a defective stationary wash-stand in the bedroom, or from the bath-room or closet, a simple catarrh of the throat from cold will allow the diphtheritic germ, or whatever the poison may be, to be engrafted upon it or be

absorbed into the system, and the only means of counteracting its influence would be the most active local treatment to the throat, and placing the child upon stimulants and medication that will strengthen it.

Whenever a child complains of a sore throat and there seems to be redness of the throat inside, or the tonsils become swollen and the child complains when swallowing, has a cough, it is always safe and indeed a proper thing to spray the throat and nose with some mild solution that will at once cleanse and soothe it. This will never interfere with the doctor's treatment, and can be done before the doctor comes. The best forms of atomizers that we know of, and one of which should be in every household, are the Davidson small hand atomizer and the Burgess atomizer, which are valuable for spraying the throat and nose, and that of Oliver, a more expensive one, but the very best so far made for inhaling lime-water or such substances as are used in cases of croup. A solution known as "Dobell's solution" can be used in these cases; also in cases of whooping-cough, or in all forms of sore throat.

There are many diseases of children that are accompanied by sore throat, or sore mouth, which require constant cleansing of the mucous membrane, or the deposit, or mucus, will accumulate, become offensive, or finally, as in diphtheria, become putrid. Great attention should be paid to the slightest throat-ailments of children, because an irritated throat is often an opening for the entrance of infectious disease.

A child complaining of difficulty of swallowing should under no circumstances be allowed to go out of doors, especially if the weather is damp or at all raw or cold. The throat should be gently sprayed with the solution just mentioned, and some counter-irritation made to the outside, using St. John Long liniment, or simply rubbing with vaseline, sweet oil, or cod-liver oil. If the child's voice is slightly muffled in speaking, if it speaks through its nose, should there be tenderness upon pressure and slight enlargement of the glands under the angle of

the jaw, on one side, and the attack come on suddenly (in an older child with a chill or high fever), the probability is that the attack is one affecting the tonsils,—one of quinsy. The household remedies to be used in such a case would be a fever-drink of two teaspoonfuls of spirits of Mindererus (liquor ammoniæ acetatis), one teaspoonful of sweet spirits of nitre to half a glass of water, sipped at frequent intervals, for a child about five years of age. The feet should be put in a hot mustard-bath and the stockings kept on afterwards, the throat sprayed, the child allowed small pieces of cracked ice; the food for at least twenty-four hours should consist of beef-tea or chicken-broth, or probably still better, if the child will take it, milk and lime-water, or Vichy water, half and half. In all these acute throat-troubles of children we have found the early application of a handkerchief wrung out in cool water, tied round the throat like a cravat and covered by oiled silk, of very great service. This treatment will often avert an attack of croup. Throat-troubles in children are by far too serious to allow any time to elapse before receiving the most thorough treatment; when a child complains, it is far better to send at once for the doctor.

CROUP.

There are some children who are particularly liable to croup: it seems a family characteristic. Boys are more apt to have it than girls,—possibly because they are more exposed; indeed, the tendency to "harden" children by letting them go barelegged, or with low necks and short sleeves, will sooner or later bring either a bad attack of croup, or bronchitis, as a consequence. Children who go constantly, as do many of the poor, without shoes or stockings are not as apt to contract these catarrhal diseases as those who temporarily have their feet exposed to cold, sudden changes, or dampness; but the child who is overdressed will perspire and be as liable to attacks of croup or bronchitis as one who is insufficiently

dressed. What is ordinarily known as croup is that affection which comes on suddenly at night, accompanied by a dry, ringing cough, difficulty in breathing, and all the evidences of threatening suffocation, without any marked previous symptom. It usually occurs at night. The child will wake from sleep with all the symptoms that are most terrifying. Its evident spasmodic character has given it the name of spasmodic croup. It may be the result of cold or of an overloaded stomach, and children who are subject to this affection should not be allowed heavy suppers.

Although the breathing is greatly interfered with during this attack, the sounds are ringing, the cough sonorous and brassy and loud; this is an important matter, as it shows there is no deposit of membrane to muffle the sound. The treatment of such a case should be as follows: a sponge wrung out in water as hot as can be borne by the child should at once be tied round the throat, and kept there by a towel, or, better, oiled silk or rubber sheeting; the feet and legs as far as the knees should be immersed in a hot bath containing a few teaspoonfuls of mustard flour, and be kept in the water for at least fifteen minutes, then thoroughly dried, and a pair of stockings put on. The child should be given a half-teaspoonful or a whole teaspoonful of syrup of ipecac,—the latter if the child is over four years of age,—followed by a drink of water every fifteen minutes until it vomits; after which the spasms will cease, and the child will turn over from exhaustion and sleep the remainder of the night. A powder of half sugar and half alum, given in teaspoonful doses or given with the ipecac, will hasten its emetic action. If the child is anxious and restless after the attack of croup has subsided, sleep seems impossible, or some cough still remains, for a child from a year and a half to two years old, ten drops of paregoric in a teaspoonful of glycerin, repeated in an hour, will have a quieting effect, or ten drops of sweet spirits of nitre in a little sugar and water can be given every half-hour or hour until the child is quiet. If the bowels have

not been moved during the day, or are constipated, an injection of warm suds will frequently bring relief.

Possibly after a good sleep the next day the child will be in ordinary health, without any marked evidence of exhaustion from the attack of the previous night; or it may droop slightly, have an occasional cough which is rather ringing, or the appetite may be impaired. If such is the case, it would be well to give the child a dose of castor oil, and by all means keep it in the nursery. If the child is over a year old, give it from five to ten, or if three years old, fifteen, drops of the aromatic spirits of ammonia, every three hours. If children who have a tendency to hoarseness and croup have their feet washed in cool water every night before retiring, they will often escape an attack. It should also be borne in mind that it is not essential that a child should have a bath every day, as some mothers believe; if the weather is damp or raw, and the child at all drooping, the surface should be quickly sponged with salt water, simply for cleansing, and the circulation increased by thorough rubbing with a soft towel. We think if the custom—which seems to be a cast-iron one with many mothers—of bathing children every day and taking them out in all kinds of weather were occasionally discontinued, there would not be so many sick children.

MEMBRANOUS AND DIPHTHERITIC CROUP.

There is no disease more appalling, or that seems more strenuously to resist all efforts at successful medical treatment, than that form of croup which is accompanied by thick mucus in the air-passages of the larynx, or by diphtheritic membrane. When speaking of diphtheria we dwelt upon the fact that it is a constitutional blood-poisoning which may exist without the presence of membrane in the throat, and also that the membrane, when it does exist, need not be limited to the portions of the throat that we can see, but may extend over the whole surface of the mucous membrane down to the lungs and upward into the nose; indeed,

when it does so, it clings firmly to the mucous membrane, leaves a raw surface when detached, and if allowed to remain acts as an obstruction to the entrance of air, or decomposes, becomes putrid, and in this way acts still further as a poison. For these reasons the spraying of the throat with an alkaline, antiseptic solution, such as Dobell's solution, which softens the membrane and prevents its decomposition, has been recommended in the most trivial throat-complaints as a precautionary measure while waiting for the doctor.

Membranous croup is recognized to be of two varieties,— one the result of catarrh, when the obstruction is caused by very thick mucus in the larynx, which may become tenacious like membrane, and the other due to the deposit of diphtheritic membrane, which may be found in connection with the deposit in the other parts of the throat, or may be simply limited to the air-passages. A child with membranous croup will probably be ailing for a few days; its cough will at first be croupy, its voice will become husky; the cough will cease, or nearly so; the breathing will become labored, and, finally, will be plainly heard at a distance. The child will show by its movements that there is narrowing of the passage in its larynx; the nostrils will dilate with each inspiration; the child will breathe with its mouth open; it will desire to sit up, so as to get all the air possible; the lips will become blue, owing to the interference with the circulation; the child will become anxious, restless, appealing to every one around it for relief; it will refuse food, but will drink water in sips. If the obstruction continues or increases, the extremities become cold, the pulse rapid and at times irregular; and finally, if nothing is done for the relief of the child, it will gradually die of asphyxia, or a sudden shutting off of the supply of air.

A peculiarity of the breathing in obstruction of the larynx is the contraction, or sinking in, of the lower portions of the ribs, or pit of the stomach or epigastrium (in health these parts expand), and the marked depression, or sucking in, of

the lower portion of the neck, just above the breast-bone. But probably eight cases out of ten of membranous croup with which one comes in contact are due to a diphtheritic blood-poisoning, which we may attribute, in our larger cities, to defective stationary wash stands in the sleeping apartment or nursery, absolutely conveying the most poisonous form of sewer-air from a bad cesspool or drain directly to the infant's room. One should never rest assured that the trap of the bath-tub, or its overflow, is secure, or that of the stationary wash-stand in the child's nursery or sleeping apartment; these should be banished to an adjoining room, where they may have free communication with the fresh air, and should be well supplied with some form of disinfectant, as Labarraque's solution. But then, again, a child with a slightly sore throat may be exposed to the gases coming from an open sewer, or to the air supplied to a furnace, which is passed over putrefying matter, or to stagnant water in the cellar; to the breath of one convalescent from the disease, or who has it in a mild form (communicated by kissing). In addition to these causes, milk, when mixed with water which has been contaminated by sewage, has been known to produce this disease. For these reasons the catarrhs, especially of the croupy kind, however slight, should be attended to at once in children, as they constitute a point of entrance of the diphtheritic poison into the system; and as children over a year old are very much more subjected to the sudden changes that produce these catarrhs, all forms of membranous croup are more apt to take place at that time.

Let us dwell for a few moments upon the nursing of such cases. There are two facts most important to bear in mind as causes of death: the one, the interference with the entrance of air into the larynx or air-passages; the other, the poisoning of the system and the weakening of the heart which accompany diphtheria, and cause the patient to more readily succumb to the influences of deficient aeration.

If a child has a croupy cough during the day, with rapidity

of breathing and slight fever, no time should be lost in influencing the mucous membrane, establishing secretion, and thus

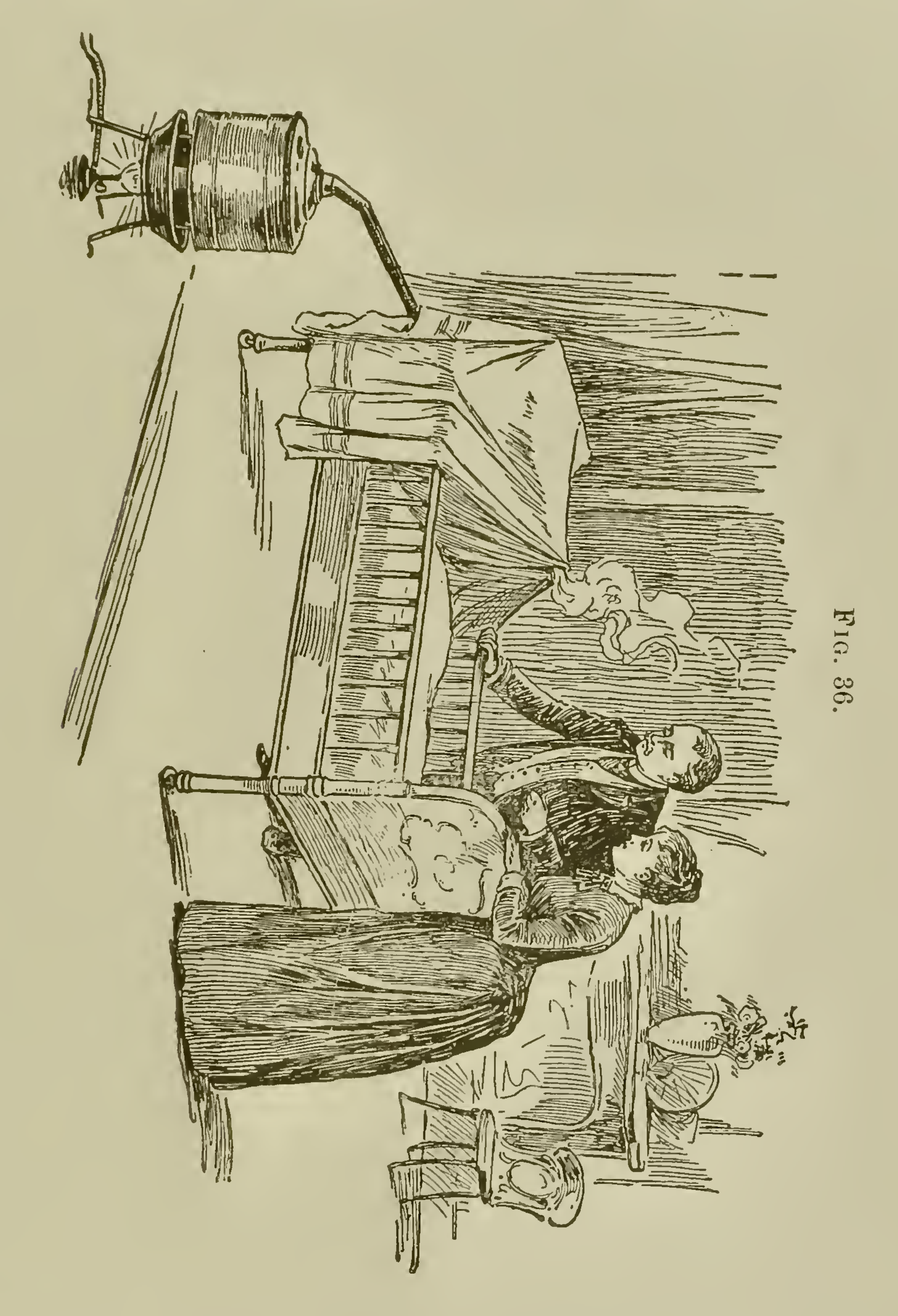


Fig. 36.

giving relief. The child should be kept in its nursery; and we may say that in all cases of bronchitis or pneumonia, and even croup, when it has to be lifted constantly from its bed, or cannot

be comfortable for any length of time in one position, the child should have a long flannel wrapper, extending much below its feet, that can be opened in front and at the back, with high neck and long sleeves. It is absolutely necessary that the air of the nursery be not only pure but warm, the temperature about 80° F. The air should also be moist, and for this purpose some arrangement must be made to have a constant supply of steam; this can be done by placing a kettle on the stove, if there is one in the room, or if not, by using a teakettle with a lamp under it. If the case seems to be one of more than an ordinary slight cold, no time should be lost in causing the vapor of an alkali to come in contact with the mucous membrane, and there is none better for this purpose than that which comes from slaked lime. Lime can be placed in a bucket beneath or beside the child's crib, and the crib covered over with a sheet in the form of a tent, allowing the vapor to accumulate within. If the child is only satisfied when on the mother's lap, the vapor can readily be brought in contact with it by throwing the sheet over the bucket and extending it over her own shoulder. The advantages of the vapor from lime are its moisture, its warmth, and its alkalinity; and if membrane should form in the throat, lime-vapor honey-combs it the same as lime-water does the curd of milk. The Arnold steam-sterilizer has fitted to it an arrangement for conveying the steam, in such cases, to a canopy placed over the crib to form a tent. An excellent and ingenious device for domestic use that we saw recently consisted of an umbrella opened over a baby-carriage, in which the child was placed, and the whole covered with a sheet. The steam was conveyed by a long piece of rubber tubing attached at one end to the spout of a teakettle placed on the coals in an open grate. If the child seems to suffer very much from the obstruction,—that is to say, if the breathing becomes rasping,—the spray from an atomizer (and a steam one is much to be preferred) should be used constantly; or if the child is old enough, it can probably for several minutes at a time inhale the vapor from the Oliver vaporizer. The solution to be employed in these cases is one-

half lime-water and one-half Dobell's solution, or if two vaporizers are in use, as should be the case, so as constantly to have some form of steam inhaled, one solution should be of turbid lime-water, made by adding a teaspoonful of *liquor potassæ* to two ounces of lime-water. Early treatment in these cases is so important that we do not hesitate to suggest that the mother or nurse, if she cannot get the advice of a physician *at once*, should lose no time, but place the child under the following treatment until the doctor arrives.

If the child's croupy cough or hoarseness should continue during the daytime, even after the hot foot-bath and the warm applications to the throat (flannel wrung out in hot vinegar and water and covered by oiled silk), the following fever mixture, which will possibly also loosen the cough, should be given until the doctor's arrival:

Solution of acetate of ammonium, one ounce and a half;
Solution of citrate of potassium, one ounce;
Compound syrup of squill, one drachm;
Simple elixir, sufficient to make three ounces.
A dessertspoonful in water every two hours for a child of two years.

Should it be impossible to get a doctor (and only in such event, for the matter is a serious one), the administration of an emetic may be important if suffocation seems imminent. If the child struggles for breath, if its face becomes bluish, its extremities cold, and the other signs of which we have spoken exhibit themselves, a half-teaspoonful of alum, with the same quantity of powdered sugar, or given with water, will be the safest emetic. A harsh emetic, such as ipecac, may disorder the stomach without a correspondingly good effect; indeed, may increase the debility, and should not be given without the doctor's advice. In addition to this, a child of over a year should take, at least every hour, five drops of the aromatic spirits of ammonia, in water.

Warmth and moisture should be applied to the chest and throat. Some physicians recommend the use of a material

that will readily absorb large quantities of liquid; a mass of lint or folds of flannel or a sponge, soaked in warm water (wrung out to prevent its dripping), may be connected by shoulder-straps and tapes at the side, placed on the front and back, and covered with oiled skin; this should be changed about twice a day or oftener. Care should be taken when the change is made; it should be done by placing the hand beneath the wrapper, and without exposing the child's chest at all. Others prefer ordinary flaxseed poultices, made in the same way. Our own preference is for two flannel bags filled with hops and quilted; these can readily be attached by safety-pins on the outside, and thus kept in place; oiled silk can be stitched on to each one, so as to prevent evaporation, and these bags can either be wrung out in water or some soothing or stimulating liniment, as the occasion requires.

The child's diet must be carefully attended to. It should be encouraged to drink freely of milk and lime-water or Vichy water, chicken-broth or beef-tea, or, if it prefers it, small quantities of beef-juice, or beef extract or peptonoids. Wine-whey, in cases where there seems to be debility, is absolutely essential; or a teaspoonful of port wine, whiskey, or brandy, in water, should be given every three or four hours. Peptonized milk is a most valuable article in such cases, and if there be difficulty in swallowing, the nourishment may be given in this form by the bowel. The *peptonizing-tubes* can be had, with full directions for their use, at any drug-store.

In regard to the feeding of sick children, absolute regularity and accuracy must be observed in their diet. The food should be of the most nourishing character, requiring least digestion, and in as small bulk as possible. There should be a schedule kept of the exact amount, and when given, so that the doctor may judge as to whether the child needs more or less in the twenty-four hours. In some diseases, such as diphtheria and typhoid fever, the child's life depends on this systematic nourishment. In the latter, the dietetics form the most important consideration, because for a long period (at least

three weeks) the child's life is to be sustained by a diet so regulated that it will give all possible nourishment and at the same time not unduly stimulate the moving of the bowel or act as an irritant to those portions which are already inflamed or ulcerated. In the nursing of diphtheria, the most important points to bear in mind are, first of all, that it is a disease capable of being greatly modified by careful treatment and nursing; that it is directly contagious by means of contact with the membrane; that systematic nourishment and stimulation are absolutely essential.

Indeed, all continued croupy coughs should be looked upon as serious, even should no evidences of diphtheria be detected in the throat. Recently the great facility with which a tube can be introduced through the mouth into the larynx has been demonstrated, with the result of a great saving of life. It is an operation devoid of the horrors attendant upon opening the trachea, and can be made use of very early in the case, before the child is exhausted and the air-passages are filled with membrane or thick mucus.

Whether due to diphtheria or not, the treatment and nursing of membranous croup are practically the same. A child suffering from this disease should have its throat washed and sprayed frequently with an antiseptic cleansing solution, such as Dobell's solution or listerine, twenty drops in an ounce of water, in order to prevent decomposition of the membrane; the air that it breathes should be pure, and at the same time charged with those materials that soften the membranous deposit and prevent its putridity. For this we have the vapor of steam containing lime, the products of tar, carbolic acid, or chlorine; but as we have gone over this matter thoroughly when writing of scarlet fever, it will not be necessary to repeat it here.

CHAPTER L.

WHOOPING-COUGH.[1]

Whooping-cough alone does not cause such a large mortality: it is fatal in its complications. In other words, being a disease that lasts six weeks, or sometimes two months, parents or nurses become careless and the babies die from debility, pneumonia, bronchitis, bowel-complaint, or some complication caused by the great straining induced by the cough.

Let us for a moment study the nature of this disease from the most recent investigations of the subject. It has been well known and thoroughly described by medical writers for many years; certainly for over three hundred years it has been acknowledged as a contagious affection, not simply a nervous cough.

It is a disease usually occurring in childhood, but is limited to no particular age. We once saw a child who had it at birth, undoubtedly, and we frequently hear of it at the age of sixty or over. It is rare for a person to have it twice. It begins as an ordinary cold, though, after the child has had apparently a cold in its head and a dry cough for some days, the cough comes on in paroxysms, usually upon taking food, or following excitement; but the child tries to suppress the cough, and in doing so the face becomes much congested. Soon the paroxysm of coughing will provoke vomiting, and then the *whoop*, or drawing in of the breath, after several forcible expulsive coughing-spells have taken place. These paroxysms increase in force and frequency; the child's face becomes blue and puffy; the little sufferer seizes on the nearest object for support; the spells are agonizing to behold; finally, after successive cough-

[1] This chapter appeared, as an article by Dr. J. M. Keating, in Babyhood for September, 1886, and is republished by permission of the publishers.

ing-spells, each followed by a gasping which produces the whoop, a violent attack of vomiting takes place, mucus runs from the mouth and nose, and the child falls back limp and exhausted, in a few moments to resume its play, without any evidence, except the puffing about the eyes, of any trouble in the respiratory tract. These are the characteristic features of the disease.

It is impossible at first to make a definite statement as to the existence of the disease; it is only after the first week or ten days, when the cough assumes the features above described, that one is certain; and especially is this the case if the child has been exposed to the disease. It is not the most contagious malady of childhood,—not nearly as much so as measles, chicken-pox, or scarlet fever; it requires, in all probability, either the breath direct from another case, or inhaling the air of a crowded room or car in which a child with the disease has been.

In the article on scarlatina what is meant by the period of incubation is explained,—that time which elapses between the direct exposure to the poison of a disease, or the absorption of its contagious principles, and that of the appearance of the first symptoms. For whooping-cough this is about two weeks, as nearly as we can calculate it.

The disease is a contagious one,—that we all know. Its contagious material resides undoubtedly in the breath of the one affected with it; it is probably taken up by the air during its passage over the secretions from the throat and nose. The air probably retains it for a long time, and these secretions usually, at the height of the disease, being excessive, are easily communicated from one child to another in play, by kissing, etc., or they dry, are finely pulverized, and are scattered throughout a badly-ventilated room. During the whole period of excessive secretion, from the first week till the cough almost disappears, the child with whooping-cough is capable of giving the disease to others with whom it comes in contact.

It is almost criminal, then, for parents and nurses to take these

children into open squares or parks (places of amusement) where healthy children congregate. And yet this is done daily.

Investigators have detected by the microscope certain germs —which have since been found in all cases of this disease—in the sputum and in the secretions from the nose. In all probability these come in contact with the mucous membrane, are directly absorbed, multiply and diffuse themselves through the blood during the period of incubation, or act in some way especially upon the delicate membrane of the nose and respiratory tract. Animals have been inoculated with this mucus and have exhibited all the symptoms of the disease.

It is a disease that runs a regular course of its own, if not treated. In Japan it is called the "hundred-day disease." It usually, in mild cases, lasts about two months, possibly sometimes three, though active treatment and careful nursing will shorten it to a very great extent, or make it very much less severe.

It is not expedient here to examine carefully the medical treatment of this disease. As far as known, no drug will at once cut short an attack, but the physician has many resources at his command that will mitigate its severity, diminish the intensity of its paroxysms, and lessen the great liability to hemorrhages, to heart-disease, to disease of the lungs, whose delicate tissue is easily damaged by forcible coughing; and it is for him to decide what is especially advisable for each particular case. He will probably give the child belladonna or quinine, or possibly recommend an infusion of chestnut-leaves. At night he may find it necessary to give the bromides of potassium or ammonium, with chloral.

To the mother belongs the equally important duty of warding off danger by careful nursing, by guarding her child against exposure, by proper clothing, careful and nutritious diet, and abundance of fresh air.

Every child with whooping-cough should have pure, fresh air, and be out of doors as much as possible in suitable weather. The sea-air, when accessible, is greatly to be de-

sired; the moisture in it, and possibly the salt, help to liquefy the secretions. It has a sedative effect, allaying nervous irritability; then it is always fresh and pure, and this is most important in the treatment. The fresh air prevents debility, and therefore wards off those serious complications due to "run down" and loss of appetite. If the patient is obliged to remain in the city, it is well to dress the child warmly, make a play-room of the top story of the house, and open the windows to insure a constant access of fresh air, purer than that directly from the street.

Diseases of the lungs are most to be dreaded as a complication; therefore all children suffering from whooping-cough should have some woollen garment, light in summer and heavier in winter, covering the entire body. It is a mistake to clothe children too warmly; active perspiration during play will only invite colds should the child be exposed to a draught. Indeed, this is the case with all children, sick or well. Often severe catarrhs are brought about in children who are overclothed.

A child should be accustomed to a daily bath or sponging in cool water; its chest, back, and *feet* should be thoroughly sponged, and then reaction brought about by a good rubbing.

There is a curiously close relationship between the feet and the mucous membrane of the air-passages. We all know how quickly wet feet, when exposed to draughts, will give a catarrh. A foot-bath of cool or cold water at night will do much to lessen the liability to colds.

A child with whooping-cough should receive a full supply of digestible, nutritious food: gruels, soups, or broths; Mellin's food; a light dinner of chicken or steak, if it is old enough, with vegetables, such as well-cooked young beets, spinach, cauliflower, roasted or mashed potatoes, and stewed fruits, as apples or peaches, that will keep the bowels regular. Milk should, of course, be plentifully used, and it is well to dilute it with lime-water, or Vichy water, to prevent it curdling in heavy masses. A child is apt to have a paroxysm and vomit

a meal just after it is taken. Some light, nourishing food which will be retained should at once be given; either a cup of broth with barley, or milk and lime-water, or some sherry and water with sponge-cake, will serve the purpose.

We have often noticed that a copious discharge of thick mucus follows a paroxysm, and that until this discharge takes place the cough will be repeated. The mother should recognize this fact and do all in her power to aid the child. In the case of an infant this can be accomplished by turning the child over on its stomach, with the head low, and detaching the mucus from the mouth with her finger. If the child is older it should be taught to blow its nose thoroughly, or probably by inducing vomiting at once relief will come and the paroxysm be cut short. A child can be very materially aided in this way and the severe strain avoided.

A large amount of the thick mucus which cannot be gotten rid of by the cough may seriously threaten suffocation. In such a case a teaspoonful of syrup of ipecac, or the same of powdered alum mixed with syrup, should be at once given to provoke immediate vomiting.

Counter-irritation to the chest by means of various liniments is certainly valuable; a suitable one will be selected by the physician, containing possibly the oil of amber, croton oil, or turpentine, in soap liniment, or possibly chloroform liniment. Our own experience has taught us that the spray from an atomizer is a valuable aid in the treatment of this disease. It can be used to make the thick mucus more watery, and also as a means of carrying medicaments directly to the surface. But it requires an immense amount of patience on the part of the mother. The nose and throat should receive in this way a thorough treatment five or six times a day. The nose should be frequently cleansed by the spray of Dobell's solution (carbolic acid, borax, soda, and glycerin).

Whooping-cough is a distinct disease, with a history of its own, and belongs to the same category as the other contagious affections of childhood. We have avoided discussion of

its medical treatment; *that* belongs to the doctor. Whatever tends to weaken the child invites most serious complications, and these are the causes of the great mortality mentioned. All patent nostrums of uncertain combination, or of such composition as to derange the secretions, produce constipation, or cause loss of appetite, are to be avoided by all means. Good nursing is more than half the battle. Fresh air, proper clothing, good, nutritious diet, regulation of the bowels, efforts to mitigate the intensity of the paroxysms by aiding the child in discharging the mucus, giving it an easy and comfortable position which relieves the strain, supporting it for the same purpose, pressure of the hand over the eyes to prevent their strain,—all these are as important as the medical treatment.

CHAPTER LI.

FEVER.

It is well to make a few remarks upon the subject of fever, as mothers are often much worried at the symptoms of heightened temperature, and are frequently at a loss to know what to do until the doctor arrives. Fever is a symptom: it may be initiatory of any of the diseases of childhood, or it may be an evidence of indigestion, or of the retention of poisonous matters, usually called biliousness; nevertheless it is only a symptom, and it is necessary to be cautious in our treatment of it until we know its cause.

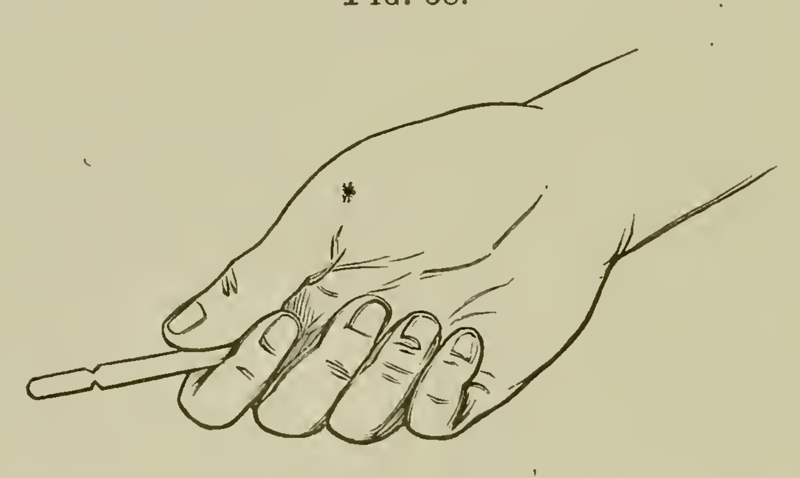
We are greatly opposed to that smattering of medical knowledge which justifies the adage, "a little knowledge is a dangerous thing,"—dangerous, because it either makes one careless when confronted by the greatest though concealed danger, or overconfident and rash when caution and experience are most required. On this account we have always kept fever thermometers away from mothers; suffice it for them to know by touch

and general symptoms that their child has fever, and then let them send for the doctor and give him the sole control and responsibility of the case. But circumstances may arise when the registration of a temperature is important, and on that account we will speak of it here. The ordinary fever thermometer is represented in Fig. 37. The thermometer is a delicate instrument, and requires care in handling. Before using it, the detached black line or register should be below the arrow, or mark of normal heat. With children old enough to understand that it is not to be chewed, the temperature is best taken under the tongue, with the lips holding the thermometer, and it should remain there for two minutes. With younger children, the armpit is the place usually selected, care being taken to hold the arm tightly across the chest and to keep the part covered. With babies, we prefer the groin or the bowel. If introduced into the bowel the end must be held on to firmly, and care taken that in introducing and withdrawing it the instrument is not broken.

Fig. 37.



Fig. 38.



The record should be noted, the register being shaken back into its place below the normal mark (the arrow). To do this, take the thermometer by the upper part, not the bulb, with the whole hand grasped about it, bulb end uppermost, and

then swing the arm from the shoulder forward with some force. The thermometer should be carefully wiped with alcohol or cologne before putting it away.

It is a great mistake for a mother to constantly take the temperature of her child for curiosity's sake; it only unnerves her, and renders her less capable of exercising proper judgment during its illness. The doctor will manage that part of the case, and he alone is capable of attaching due importance to the readings.

To return to our subject. A child is languid, refuses to play, its head is hot, the skin is dry; in other words, it is feverish. Its face is flushed, it is irritable, or possibly drowsy, or it may be unduly excited. What should the mother do? It may be indigestion; it may be biliousness; it may be one of the eruptive fevers coming on. Put the child to bed at once, after giving it a hot foot-bath, to which a little mustard (a teaspoonful to a basin of water will suffice) is a good addition. Give it half milk and half boiling water, if it craves drink and needs nourishment; keep light covering over it, and prepare a drink consisting of a tumbler of water, a teaspoonful of sweet spirits of nitre, and two teaspoonfuls of spirits of Mindererus, to be taken at intervals, if it is thirsty. Some children crave pure water when feverish, or weak lemonade with but little sugar; if so, let them have it. Water in fever, internally and externally, we now know to be the best thing, and we look back with pity upon the sufferings of those poor creatures who were refused it most emphatically not many years ago. If the fever increases, and the child becomes restless, hot, delirious even, sponge it off with water that feels slightly cool to the hand, and to which has been added cologne, alcohol, or vinegar. This sponging should be done every hour or two, the child protected carefully from draughts, and each part properly covered after it has been sponged; even should the attack be one of an eruptive fever it will do no harm but much good. Keep the head cool in the same way. If the doctor does not come within a few hours, look at the tongue; if it is coated,

dusty-colored towards the centre and back, give the child of one year or older a tablespoonful of solution of soda mint and a teaspoonful of spiced syrup of rhubarb, and in an hour or so an enema of warm water and sweet oil. If the belly seems distended, add a teaspoonful of the tincture of assafœtida to the enema. Next morning, when there is a good light, examine the body for an eruption; if you find on the neck and chest a uniform rash, if the tongue is red on the edges, if the throat is red, and possibly the child has been nauseated, or indeed has vomited, you have a case of scarlet fever to deal with. But the chances are that your anxiety will be allayed by the subsidence of the symptoms; the bowels will move copiously, the passage consisting of bilious, slimy matter, or the child may vomit some undigested material, break out in a profuse perspiration, and fall asleep, to awake bright and well. If so, diet well for a few days; keep to soups and broths; avoid solid food and too rich milk; or you may find that the throat—with a few white flakes like curds on the tonsils, which so frightened you and caused you *rightly* to send for the doctor at once and to urge haste—has lost the red, angry look and deposit under the judicious treatment by a laxative, preferably calomel and soda, and spraying with Dobell's solution, which he instituted. These sudden fevers, together with throats like this, look surprisingly like diphtheria, and cause just alarm, though they are probably only the result of indigestion. Some cases of diphtheria start in this manner, and as we cannot at the outset distinguish between them, the utmost care in treatment is required.

LIST OF ARTICLES FOR THE FAMILY MEDICINE-CHEST.

Castor oil.
Aromatic syrup of rhubarb.
Distillate of hamamelis.
Paregoric.
Laudanum.
Sweet spirits of nitre.
Spirits of Mindererus (liq. ammon. acetatis).
Aromatic spirits of ammonia.
Chlorodyne.
Brown's essence of Jamaica ginger.
Soda-mint tablets.
Valentine's or Wyeth's meat extract.
Benzoated oxide of zinc ointment.
Cold cream.
Vaseline (white preferred).
Court plaster.
Adhesive plaster (rubber).
Roll of carbolated antiseptic gauze (Johnson & Johnson).
Sulphonal, five-grain compressed tablets.
Bromide of potassium, five-grain compressed tablets.
Phenacetin, five-grain compressed tablets.
Chloride of ammonium, five-grain compressed tablets.
One dozen compressed tablets, *each one* containing one-sixth of a grain of calomel and two grains of bicarb. of soda.
Tincture of iodine.
Syrup of ipecac.
Essence of peppermint.
Tincture of assafœtida.
Mustard leaves (two strengths).
Belladonna plaster.
Subnitrate of bismuth.
Alcohol and a lamp.
Syringes for enemas, one a fountain, and another of hard rubber, holding two ounces.
St. John Long liniment.
Medicine-dropper.
Graduated medicine-glass.
Compressed tablets of tincture of aconite, *one minim each*, for fever.
Bicarbonate of sodium.
Glycerin suppositories, put up in tin-foil or waxed paper and in a glass-stoppered bottle.
Dobell's solution and Burgess's atomizer (or Seiler's antiseptic tablets).
Compressed tablets for making *lime-water*.
Chlorate of potassium in five-grain tablets.
Elixir of cascara sagrada (laxative), or compound liquorice powder.
Menthol or red pepper (solid liniment).
Powdered alum.
A few bandages (in rolls of two widths).
Compressed quinine pills, two grains each (fifty).
Lady Webster pills.
Dover's powder, compressed pills, five grains each.
Tarrant's aperient, or Seidlitz powders.
Glycerin.
Listerine.
Gallic acid.
Absorbent cotton.
A fever and a bath thermometer.

Of course this is a very complete list, and many of the articles suggested will only be necessary for a family going to reside for a time at a distance from a physician or drug-store. One should never travel without a supply of whiskey, mustard flour, flaxseed meal, and some pieces of old linen and flannel.

CHAPTER LII.

SCARLET FEVER.[1]

Scarlatina is the Latin name for scarlet fever in all its forms, those most grave and those most mild. There is another point of great importance, which is, that the mildest cases of scarlet fever have often the saddest ending, owing to the want of attention to those details of nursing which exclude the possibility of serious complications by exposure or neglect. Every doctor has heard the statement, when questioning in regard to the antecedents of dropsy or possibly some destructive disease of the ear, "My child had only scarlatina; it was so mild that really we did not see the necessity of punishing the little one by confining it to its bed or room."

Scarlatina is scarlet fever, and a mild attack of this most treacherous disease may become as serious as a very severe attack,—often more so, as the one will be cared for and the other neglected. It is, therefore, necessary thoroughly to understand the principal features of this disease.

It is undoubtedly caused by the entrance into the system of a *something* which has all the characteristics of matter. This *something*, which, as we shall see, requires a certain time thoroughly to infect the blood in which it circulates before the symptoms of the disease show themselves, is called a *germ*. This germ has *weight*, proven by the fact that it occupies a certain space; can be carried in clothing or merchandise, or by the air; it does not evaporate or become gaseous; it is transmissible, and at the same time is very subtle, can

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[1] This chapter appeared, as an article by Dr. J. M. Keating, in Babyhood for February, 1886, and is republished by permission of the publishers.

insinuate itself in cracks and crevices, in the breath of individuals, in their hair, in clothing, in letters. It is a living material, whose vitality may lie dormant for years, and then, like grain, grow under favorable conditions; it can be destroyed by heat, probably by intense cold, or by chemical agents. But it is unlike the grain in one most important characteristic, which is this: a grain—say of wheat—may have remained dormant since the time of the Pharaohs, and, taken from a mummy-coffin, placed in heat and moisture, it will sprout, but will only produce *one* stalk. The germ of scarlatina may lie dormant, but when aroused into activity by suitable associations it will act as a leaven,—as a ferment; this minutest microscopic object will perpetuate its species until it invades every organ and tissue of the body. On this account this disease is classed as *zymotic* (from *zyma*, ferment).

Scarlet fever can be communicated by infected milk; and, so far as we know, the milk has only to stand in the room where the disease exists, or has existed, to absorb the germs, which are so subtle, so light, and yet so tenacious, as to float in the air and adhere to particles of dust.

We all know how much dust is constantly floating in the air; let a beam of sunlight pass through an opening in the shutter, and we can readily see how the scales of the skin from the body, pieces of lint, etc., can carry these microbes which may be thrown off in the mucus from the nostrils and mouth or in the perspiration, and even in the urine.

Not only are these secretions germ-carriers,—that is, contagious (and they have all been proven so by direct inoculation),—but the passages from the bowels as well as the urine are so. In that way sewer-air may be a means of their conveyance; drinking-water also, as well as the vapor from the soil on which these matters have been thrown. Bear in mind, then, that the scarlatina poison can be carried in this way hundreds of miles; that it does not need the personal contact of individuals; that it retains its vitality for months and even

years unless it be subjected to certain influences that either entirely destroy it or deprive it of its malignancy; these are intense heat, especially boiling or steam, plenty of fresh air, and certain chemical substances, as chlorine, sulphurous acid, and others.

The poison of scarlatina is either inhaled by the individual or swallowed; it is then taken up by the circulation, and, finding itself surrounded by material which develops it, vivifies it, is rapidly reproduced, and the symptoms of the disease show themselves. This period between the reception of the poison and the appearance of the symptoms is called the period of incubation; this is known to be from one to six days; in some cases longer.

Unless we definitely know that the child has been exposed to the disease, we cannot detect its presence till the rash appears, and this takes place within twenty-four hours of the first symptoms. What are these? Chill or convulsions, delirium, intense headache, sore throat, swelling of the glands of the neck behind the jaw (kernels), nausea or vomiting, associated with high fever, bounding pulse, and dry skin. The first three of these may be absent in mild cases; the others are nearly always present to a greater or less degree.

Under such circumstances what should be done? The child should be put to bed by itself in a separate room; it should have a hot foot-bath, the water—with or without mustard—about as warm as the hand can bear. It should be lightly covered with a sheet and light blanket; it should be kept as quiet as possible, and given frequently warm milk in small quantities, with lime-water or so-called "cambric tea," and no solid food. Do not purge; in fact, avoid all medicine —with the exception possibly of a little sweet spirits of nitre, a teaspoonful to half a tumbler of sweetened water—until the doctor arrives. At the end of from six to eighteen hours the rash will appear. It will be noticed in patches, fading into the normal color of the skin, on the neck, shoulders, and chest, then on the abdomen, and finally on the trunk, arms, and

legs. It resembles the redness produced by a mustard-plaster, and feels rough to the hand when fully developed.

The disease is now fully determined; the fever is high, the restlessness is usually increased, the throat symptoms are marked, and the secretions are diminished. The most urgent care is now to be taken in the nursing. All superfluous hangings, such as curtains or pictures, should be removed from the room. The child should be nursed by one who has all the details of the case under her charge, who should wear the simplest kind of clothing, that can be daily changed and washed or aired. She should have an adjoining room in which to keep her clothes and make her toilet. Everything that comes in contact with the child, such as towels, brushes, blankets, or sheets, should be kept rigidly separate, and thoroughly boiled and aired before being taken from the premises.

The room should be kept thoroughly ventilated, either by keeping open a window in the adjoining room or by some arrangement attached to the window of the sick-room which will allow the ingress and egress of air without a draught; the temperature should be kept at about 68° F., and regulated by a thermometer. If the room receives its heat from a furnace, the hot air should be made to pass over a pail of water containing either diluted Labarraque's solution or Platt's chlorides, and a towel with one end dipped in such a solution should be tacked over the register. If there be a stove, or, better than all, an open grate, these solutions can be placed near by, so as to be readily evaporated and distributed throughout the room.

The chamber should always contain some such solution in which to receive the excreta. A small quantity of urine should daily be collected in a clean vessel for the doctor's examination. It is usual to anoint the child with some greasy substance; this allays the intense itching or pricking, which is most annoying, it softens the skin, which is inflamed and swollen, it depresses the fever to a certain extent, and it serves to collect the scales of the skin, which, if shed, act

as carriers of contagion, and which are usually shed in flakes. Washed lard, white vaseline, or carbolated or thymolated vaseline are used. The child should have its mouth washed once or twice daily, as also other parts of its body, for purposes of cleanliness, and the water used should contain either very diluted Labarraque's solution, vinegar, listerine, or phénol-sodique, and possibly the doctor will order the frequent use of the hand-spray, using some good disinfectant for the throat in these cases.

What are the dangers incident to scarlet fever? Extensive disease of the throat with complications of diphtheria, disease of the ear with permanent deafness, disease of the eyes; more important than all, serious complications due to inflammation of the kidneys, made evident by dropsy and convulsions, often ending fatally. To avoid these, which may take place in the mildest cases, from exposure to draughts, imprudence, and want of cleanliness and attention, great care is necessary.

The question of bathing or sponging a child ill with scarlatina must be decided by the doctor. Sometimes it is necessary to depress the temperature, as a prolonged high temperature will kill; but in all cases, however severe, cleanliness should be insisted upon,—the face and hands, the eyes, ears, mouth, and genitals, should be kept clean and free from secretions.

The temperature usually remains high till the decline of the disease,—about the fourth or fifth day in ordinary cases. As soon as the fever has subsided and the eruption has faded, and the skin-shedding is well established, it is customary to sponge the body off thoroughly in tepid water and clean the head, using a fine sponge or soft linen, avoiding draughts, and keeping the body well covered, with the exception of the part being washed. We have found a preparation known as "Little's soluble phenyle" admirable in this connection, a few drops of it being added to the water. It is disinfectant and leaves the skin soft. As kidney-troubles usually show themselves during or following the scaling stage, greater precautions than ever are to be used at this time. The urine should be examined every day or two. The diet should be mostly liquid,—that is,

milk, or milk and lime-water, gruels, soups, and such like; the child should be encouraged to drink freely of water, the bowels must move daily, if necessary by an enema, and under no circumstances should the patient be permitted to leave the room unless great precautions have been previously taken. In this climate we have to be very particular, owing to the sudden changes of temperature, and it is far better that the child should be kept in-doors a few days longer than the parents usually think necessary than to run the great risk of kidney diseases, or rheumatism with its serious effect upon the heart, which may follow such exposure.

After the child has had several changes of underclothing, has been well washed a number of times, and at least two weeks have elapsed since the disease declined, it can be removed to another room, and the sick-room fumigated. This should be done by igniting some sulphur in a saucer in the room, all the windows and doors having been previously closed and the cracks stuffed. After twenty-four hours the room can be opened and full ventilation permitted. All the furniture should be wiped with a damp cloth, and the paint-work washed with water containing the chlorides or borax. The room should remain unoccupied for some time and be thoroughly aired.

The school-room is undoubtedly the place most to be blamed for the distribution of scarlatina poison. To get rid of the other children they are sent there while the mother is nursing the sick one at home. Some children possess a remarkable immunity from this disease; nevertheless they act as carriers of contagion. Then, again, servants or child-nurses often carry it in their heavy shawls from house to house, taking it directly from a sick-room to the nursery.

Scarlatina, so far as we know at the present time, only comes from previous cases of the disease. *Cleanliness not only lessens the danger of serious complications which are often fatal, and mitigates the severity of an attack, but it is the great germ-destroyer, and prevents the spread of this dread disease in households.*

CHAPTER LIII.

MEASLES—MUMPS—VARICELLA, OR CHICKEN-POX.

There are so many things in common between scarlet fever and measles that it will be unnecessary to repeat. Measles is a disease which comes from a special poison of its own, one which only produces measles; this poisonous principle, or germ, is especially active in the breath, in the secretions from the eyes and nose, and the whole respiratory tract; and as these secretions are very much more active—in fact, constitute a marked feature—in this disease, the child affected with it forms a focus of contagion for those who come in contact with the air which has passed over the surface of its mucous membrane. The anointed skin in scarlet fever, the absence of marked catarrh and of profuse secretion, the thorough isolation which is always insisted upon, probably account for the fact that measles seems by far the more contagious disease. There is another peculiarity which also accounts for this: the catarrh of measles, resembling an ordinary cold in the head, may be mistaken for such, and the child for the few days preceding the rash may associate with other children, and thus disseminate the elements of contagion. The period of incubation in this disease is from twelve days to two weeks, but of course during this time, unless there be a history of exposure, there is nothing special to attract our attention. The disease usually manifests itself by all the symptoms of a violent cold in the head: the eyes become suffused, very watery, and intolerant of light; the discharge from the nose is constant, the child's face puffy and red, apparently swollen; there is a tendency to drowsiness. Of course there is fever, the child's skin is hot and dry, and the little sufferer rolls and tosses from side to side. These symptoms are not very marked at first, and the child is supposed to have caught cold; but they increase in

severity, and it is not until about the fourth day that the rash makes its appearance upon the face. Previous to this, however, if the throat be examined, the outline of a rash characteristic of measles can be determined upon it. All this time the child suffers with paroxysms of a dry, ringing, croupy cough; the tongue is usually slightly coated, the appetite is lost, and the fever, with the catarrh of the mucous membrane, gives rise to intense thirst. The first appearance of the rash is upon the temple, the forehead, the neck, extending down the chest and arms, and finally covering the body. The word rash is a misnomer when applied to the eruption of measles, and refers more especially to that in scarlet fever. When noticed upon the forehead, the temple, or the neck, it seems at first as if it were beneath the skin,—a number of small clusters or points, resembling flea-bites, that form a crescent; when the finger is passed over the surface, a slight elevation is noticed. These elevations increase until they rise distinctly above the surface and form a papule. As soon as the whole body becomes covered with the eruption, the skin is decidedly rough and papular to the touch, and the crescentic outline of the papules in these patches over the entire surface of the body can be distinctly noted. There is no mistaking a case of measles at this stage, or confounding it with scarlet fever. The suffused eyes intolerant of light, with swollen eyelids, the puffy face covered with its speckled eruption, the excessive nasal discharge or evidences of swelling of the mucous membrane of the nose, the croupy cough, which is constant and annoying, are in themselves sufficiently plain to be the distinguishing features. The rash after three or four days gradually fades from the surface, leaving in many cases a slight staining of the skin in freckles or spots, disappearing first from the parts first affected. The fever gradually subsides, though the cough and evidences of bronchitis may remain for some time longer. The skin will not come off in flakes, as is usual in cases of scarlet fever, especially where no ointment has been used; it is usually shed in small bran-like scales.

The lungs bear the brunt of this disease in neglected or severe cases, and just as we guard the kidneys in scarlet fever, to prevent their congestion, so in this disease we protect the lungs from the very first, by carefully guarding against draughts, impressions of cold, internal congestion, by endeavoring to establish the eruption over the whole surface of the body, by protecting the eyes from light and the skin from draughts. Measles is a disease which is very fatal among the poor, much more so than scarlet fever,—that is, in the earlier stages,—owing to the fact that acute diseases of the lungs, as congestion, pneumonia, kill very much more quickly than the diseases of the heart and kidneys that follow scarlet fever, which probably do not show themselves for weeks or months after the termination of the disease. Croup in all its forms, bronchitis, congestion of the lungs, pneumonia, may occur in the earlier stages of measles and be fatal, through exposures to draughts and through improper nursing; nor, indeed, is a child entirely safe until all evidences of catarrh of the respiratory organs have disappeared. Taking a child into the cold air too soon may bring on a fatal pneumonia; exposure to sewer-gas in the sleeping-room may produce a fatal diphtheritic croup; exposure to the contagion of whooping-cough may engraft this disease, with serious results; throwing off the bedclothes, thus chilling the body, may congest the lung or eventually affect the heart; then, again, indigestion may produce an irritation of the bowel, and a serious diarrhœa follow. The mucous membrane of the stomach and bowel is affected in this disease simultaneously with the mucous membrane of the respiratory passages. Although vomiting is not so apt to occur as an initial symptom as in scarlet fever, still diarrhœa, especially in the heated term, is often a serious complication, probably indicating inflammation of the bowel, and should be carefully watched. Not alone do we have complications of so serious a nature as to threaten life, but in scrofulous children, or those who are simply run down, loss of sight or of hearing may be the result of careless nursing, or the child may die of "marasmus" (tuberculosis).

The same general principles regarding the ventilation of the sick-room, cleanliness of the body, diet, ought to be observed in the nursing of measles as we have just laid down for that of scarlet fever, possibly slightly modified, owing to the difference in the two affections. Thus, in measles the tendency to pulmonary congestion will necessitate keeping the feet warm to promote circulation, and possibly the use of poultices to the chest, or of cotton or some non-conducting substance. A child with measles should be guarded as carefully against going out too soon as in scarlet fever. We will once more impress upon mothers the fact that if they have a dry, well-ventilated, sunny nursery, apart from the sleeping-room, it is a mistake to run any risk by taking a child out of doors when the weather is the least objectionable,—that is, on damp, raw, and foggy days, or when the winds are piercing. We insist upon this, not only in the case of children who are convalescing from disease, but even for those who are perfectly well. There would be fewer catarrhs and sore throats if this plan were more generally adopted. Great care should be taken, when a sick child has a movement from its bowels or bladder, that it is well covered and protected from draughts.

We need not repeat all that has been said when speaking of scarlet fever, in regard to the diet and home treatment; the mildest form of nourishment should be given,—milk, diluted with an alkali, given at frequent intervals; also chicken-tea, egg albumen in water, beef essence or juice, with cracked ice, toast-water and wine-whey, or wine-whey and barley-water. *No solid diet should ever be given in fevers.* The child should be allowed to drink water freely, but in small quantities at a time. Glycerin and water, the proportion being a teaspoonful in half a tumbler of water, will often relieve the dryness of the mouth and throat, at the same time allaying thirst. Weak lemonade sweetened with a little glycerin, not immediately after milk, is most refreshing in fevers. Sweet spirits of nitre, a teaspoonful to a tumbler of water, will quiet the nervous system, if the child drinks frequently of it during the night, and is likely to

promote sleep. A hot foot-bath is always efficacious, if the feet are kept warm afterwards. A teaspoonful of spirits of Mindererus, with a teaspoonful of sweet spirits of nitre, in a half-tumbler of water, forms a household fever-mixture which can be safely sipped by a child from time to time until the doctor arrives. Anointing the body, as in scarlet fever, with carbolated vaseline or cold cream, allays irritability even from the onset of the eruption. The room should be darkened, as the eyes are weak.

MUMPS.

This most painful affection is a common disorder of childhood after the fifth or sixth year. Every one knows the appearance of a child with the disease, and the frightful disfiguration which exists when one or both parotid glands become inflamed and swollen. The parotid gland is situated over the articulation of the jaw, in front of the ear, and either one or both are involved in this disease. Great pain is caused by moving the jaw, or, indeed, by any sapid substance in the mouth which makes the gland secrete saliva; the pain radiates in all directions, owing to the nerves that are in connection with the parotid gland and the involvement of the chain of glands in the neck. The disease may occur without there being any other case in the neighborhood, but, as it is most contagious, it usually spreads from family to family, sparing none.

It begins with slight fever, followed in twenty-four hours by stiffness in the jaw and earache, the stiffness extending down the neck; then slight tumefaction over the gland of either one or both sides. The skin being tense, the swelling of the gland gives rise to great pain, which may be constant or paroxysmal. The swelling extends to the glands below the jaw, and the face then becomes greatly disfigured. The disease usually reaches its height in four or five days and then declines; but sometimes it runs a much slower course, not ending for two or three weeks.

The treatment of this disease is, of course, that usually adopted in fevers of all kinds,—rest in bed, avoidance of solid food, water to drink, liquid diet, and, if the little patient is constipated, an enema of warm water and sweet or castor oil to unload the lower bowel. Should a doctor not be obtainable, the mother should at once carefully examine the child's throat to note the presence or absence of membrane, or enlargement of the tonsils (quinsy), as diphtheria and quinsy are the two affections most likely to be confounded at first with this disease. But as soon as the tenderness and pain in the angle of the jaw develop, and the throat has been found free of patches and swelled tonsils, the true nature of the complaint is made evident. The blandest nourishment and fluids, as that is all the patient will tolerate, should be given, such as warm milk and Manitou, Vichy, or lime-water, peptonized milk or gruels made quite thin, wine-whey in small quantities, if the child is delicate; the white of egg in warm water, dissolved and sweetened slightly; but all soups or beef-tea or any material that requires salt should not be given. As the jaw becomes swollen and painful it should be rubbed gently with warm sweet oil and laudanum, a tablespoonful of the former to a teaspoonful of the latter, or a sponge wrung out in hot water and covered with oiled silk, rubber cloth, or waxed paper, should be placed on the tender gland or made large enough to extend down the painful chain of glands of the neck. Avoid draughts, as catching cold is a bad thing; avoid getting the nightclothes and bedclothes wet, but allow plenty of fresh air in the sick-room.

Carefully sponge the child's body daily with tepid water, cologne, or listerine, and very carefully wash the mouth out several times a day with a soft linen rag and listerine or Dobell's solution. The viscid mucus, which is secreted in abundance by the inflamed gland, collects in the throat and causes choking or difficulty in swallowing, or gives a bad taste, while the pain caused by the slightest movement of the jaws prevents the child from getting rid of it. Ice to suck in small pieces, or crushed, is often most refreshing and acceptable; in-

deed, vanilla ice-cream is frequently the only nourishment a child will take, and is often a most valuable nutrient for the sick.

Remember the contagiousness of this disease and keep the other children away from the sick-room. It is astonishing how an attack of this sort will prostrate a child, so care must be taken, especially in winter, not to let one go out of the sick-room until all evidences of the disease have vanished, nor out of the house till there is strength enough to resist change in temperature. During convalescence a child should be liberally fed, at stated short intervals, with light puddings,—rice, sago, etc.; nourishing soups made from "stock;" gruels flavored with vanilla or raisins, so as to encourage the appetite; milk, of course, and plenty of bread and butter, in addition to the regular diet of meat, eggs, vegetables, and fruit.

VARICELLA, OR CHICKEN-POX.

This disease, so common in children, is one of the mildest of all the contagious diseases, and yet is important, owing to the disfigurement which will follow unless carefully managed. It usually occurs in young children, and affects all in the family.

There may be some fever, but there is nothing to call especial attention to any particular disease other than a bad cold in the head; but in twenty-four hours, probably as late as forty-eight, little distinct rose-spots with a darker point in the centre will appear, usually from fifteen to twenty-eight in number, scattered over the body. Sometimes there are more of them and sometimes they run together. On the second day a fresh crop appears, and by this time the first have turned into little bladders of clear water. In a day more these little vesicles have become milky in appearance, and by the fourth day from the milky appearance they have turned yellow and dried up, forming a scab, which on the eighth day falls off without leaving a permanent scar. But the eruption is apt to be very itchy, intolerably so at times, and the

child will scratch it until it bleeds, causing the vesicles to become confluent in places, and ultimately resulting in disfiguring scars. To avoid this the child's hands should have soft mittens tied on them; indeed, at times it would be well to tie the hands down for a day or two. The body, especially over the vesicles, or where they are most numerous, should be thoroughly but carefully anointed with carbolated or thymolated vaseline (white). A warm bath towards the end of the attack is most soothing. As there is very little fever attending the disease, and children who catch it are usually young, but little change from the ordinary diet is required.

CHAPTER LIV.

SECOND DENTITION.

This work would be incomplete were we simply to devote our attention to that time which is limited to the cutting of the milk-teeth. There are various disorders of childhood that are dependent more or less upon the disturbance of the equilibrium that should be maintained between growth and development. This disturbance is usually brought about by the unnatural pressure which fashion or habit exerts upon the growing tissues of the child, by brain-forcing and muscle-cramping, by the want of that freedom and abandonment which gives food for the muscles' growth and carries away the ashes resulting from their destruction, and by the pernicious system of over-education, that endeavors to place an adult brain in a child's body. Indeed, this attempt at forcing is productive of the many disorders which attend the period of permanent dentition.

It is not the cultivation of the mind that physicians object to, but the system by which it is often accomplished is radically wrong.

After a child has passed its first dentition there is little to attract our attention, barring the complications that may arise from contagious diseases. About the sixth year it will cut the four first molars, about the twelfth year the four second molars, and after the eighteenth year the so-called wisdom-teeth. These teeth are all permanent ones, and the jaw has to change in shape and size to accommodate them as they grow; they produce a certain amount of pressure upon the nerve-pulp at their base, and give rise to neuralgia and reflex disturbances, together with irritation of the mouth, the throat, consequent disorders of the tonsils, ear-troubles, and, possibly, disorders of the intestinal canal, interference with digestion, with blood-making, and perhaps, as a consequence, many of those peculiar hysterical phenomena that attend puberty both in boys and girls, but especially girls. In fact, a child's brain that is excited by over-study, over-stimulated,—in other words, congested, and by blood that is not of the purest, owing to deficient exercise and under-feeding,—falls a ready victim to the slightest pressure or irritation that results from the growth of these permanent teeth. The other sets of permanent teeth, that are cut from the sixth to the fourteenth year, simply take the place of milk-teeth, and, consequently, do not produce the same degree of irritation. It is, indeed, a difficult matter to decide in an individual case exactly how much disturbance is due to teething and how much to the general impairment of nutrition which results from the child's surroundings and mode of life.

A strong, healthy child, brought up in the country, rarely has any difficulty at this time.

The general impairment of nutrition, followed by debility, languor, all resulting from the loss of, or perverted, appetite, and defective secretions, are the most frequent disturbances that we meet with during second dentition. We have at this time, also, disturbance of the mucous membrane of the mouth, of the gums, due to the irritation of the milk-teeth, whose roots become absorbed; possibly, want of clean-

liness may lead to incrustations or to a spongy condition of the gum, with pressure and ulceration. Enlargement of the tonsils, with various forms of inflammation, are also very apt to occur at this time, especially that variety which is attended by a grayish deposit, very readily mistaken for diphtheria, and to which the physician's attention should be immediately called. There is, too, a tendency to chronic enlargement of the tonsils, which will give rise to earache, sometimes difficulty in swallowing, snoring at night, with restlessness, and a tendency to acute inflammation or quinsy upon the least exposure to cold.

Such children are prone to attacks of headache, toothache, or neuralgia of the face; their tongues are apt to be coated; they have frequent bilious attacks. At this time, also, what is known as scrofula is apt to develop; enlargement of the glands of the neck, weak eyes, nasal catarrh show themselves. These conditions, although occurring at the same time as the second dentition, are by no means dependent upon it in all cases; they are attendant upon excessive growth and faulty development, malnutrition, and inherited taints. During this time also occur frequently those deformities which are the result of improper deposit of lime in the bone, or of the reabsorption of bone from pressure due to all sorts of mechanical causes; among these we find the diseases of the joints, curvatures of the spine, and also the imperfect formation of the permanent teeth, which renders them brittle or soft, readily broken, or easily affected by the acid eructations that come from a disordered stomach,—a mere shell of a tooth, as it were, which soon becomes carious, and unfortunately cannot be replaced.

We see, then, that the mother's attention should be called to her rapidly-growing child, in order to perfect its development in such a way that its tissues will be well formed and nourished, its functions established, by the time it reaches maturity. There are certain other disturbances which occur during second dentition that require our attention; these are frequent

bilious attacks, or certain fevers apparently due to growth, that come on without any appreciable cause. A child will have a slightly-furred tongue, will complain of pain in its bones, of languor, loss of appetite, will be restless in its sleep, will suffer from headache, which is usually frontal. Suddenly it will develop a high fever, the face will be flushed, the eyes red, and indeed, if vomiting occurs, and the child has not previously had the disease, we might almost expect the onset of scarlet fever. The child should have a hot mustard foot-bath, and should be given sweet spirits of nitre in its drinking-water; if the tongue is coated, it should be given a dose of either Murray's or Phillips's fluid magnesia, or a dose of castor oil or spiced rhubarb, and the chances are that the next morning the child will awake bright and cheerful, without any bad results from its attack.

Rheumatism is very common at this period of life; indeed, many of the cases of so-called growing-pains are neither more nor less than masked rheumatism. If a child complains constantly of aching in its limbs, and seems loath to take exercise, the attention of the doctor should be called to its condition.

Elsewhere we have written of the care of infants during the period which terminates at about the age of five years. Before this time there is not much to call our attention to any difference between the sexes: the girls are usually more delicate, the boys hardier; the girls, having more tender skins, are more liable to eruptions. Boys are more difficult to bring up, owing to the fierceness with which they are attacked by infantile complaints, and their greater exposure. Usually the difference in sex makes itself manifest in temperament as soon as the infant becomes sufficiently independent to amuse itself, and especially is this the case with the first-born, who has no one to copy, no playmate older than itself by whom it can be led. Even at this early age parents should as much as possible endeavor to train a child to enjoy out-door amusements, and give it exercise, that it may grow hardy, graceful, and cheerful in disposition. This will have to be encouraged in the girls; the boys take to it as ducks take to water.

It is during these tender years, while the bones are yet frail and soft, that those deformities which become the source of so much disease in later life develop themselves. People are apt to imagine that rickets and scrofula are confined chiefly to the lower classes,—to the poor. This is a great mistake; they enter every household where the conditions which favor their development are found.

Let us dwell for a few moments upon a matter of so much importance in infant life. All the long bones of the body are composed of three parts: the two ends which come in contact with the same part of other bones and form the joints, and the shaft. In later years these ends become united to the shaft, and the whole becomes one solid bone. Bones are composed of two kinds of material: the gelatinous, which gives pliability and elasticity to them, and the mineral, which makes them firm and strong. Of the latter, the salts of lime form the most important part.

In infant life the growing bone receives an immense amount of nourishment; it grows rapidly. The centre is spongy and filled with blood-channels. The bones are by no means hard at this age, and should anything diminish the amount of lime they receive, or through malnutrition a low grade of inflammation be engendered, the movements of the child, the straining of its muscles, the weight of its body, will cause the bones to curve, and unless attention is immediately given, this curving will be permanent. Especially is this the case where the bony shaft is attached to the cartilage to form a joint; naturally, the rapid growth requires such joints to be loose and yielding and elastic, and the constant strain will so stretch them as to produce deformity.

A child who, instead of running out in the fields or gayly skipping along the street, filling its lungs to the utmost and sending ample nourishment to every tissue of its body, sits by the hour by its mother's side nursing its doll, though a beautiful object, is also a melancholy one, as time will show that nature's laws are being interfered with. We know that there is a

pressure of fifteen pounds to every square inch of surface on all bodies at the level of the sea. In breathing, a certain amount of force is required to overcome this. In a frail, delicate child, whose muscles are imperfectly developed, the lungs are scarcely ever inflated to their full extent, and the constant atmospheric pressure not being overcome, tends to flatten the chest-walls, so that when the bones are hardened the breast-bones assume the form known as pigeon-breast. One great cause of consumption is thus introduced.

A child that is constantly made to breathe fully and deeply by means of out-door exercise, and who at the same time has its chest freed from all restraints of close-fitting garments or the injurious requirements of fashion, will in the future bless its parents for the great gift of health, which is an heirloom of priceless value. *The girls as well as the boys should be straight-limbed and full-chested.*

The disease called rhachitis, or rickets, is brought about not only in those children whose parents live in damp, ill-ventilated dwellings, devoid of all the comforts of life, exposed to the intense cold of winter and to the great heats and atmospheric impurities of summer; it is also noticed among the rich, who, possessing every comfort of life, may, either through ignorance or carelessness, fail to supply food which nature has intended to make bones firm and muscles strong, or they may neglect to see that their children are kept in a proper state of health to digest and assimilate such food.

Fashionable mothers are only too desirous of transferring their duties to an experienced nurse, and consider that task complete which was intended by heaven as a sacred duty, when they have purchased the most fashionable baby-carriage and a full supply of condensed milk. Experiment has shown that the strongest animals can be made rickety by the character of the food on which they are fed, and experience shows that children who have a tendency to rickets, if fed upon nutritious food and given plenty of fresh air and exercise, can be made strong, and will outgrow the predisposition. It is on this ac-

count that so much stress is laid upon the use of the various cereals in the feeding of growing children, especially oatmeal and cracked wheat. Every child—after the completion of its first dentition—should be given three regular meals a day: the breakfast consisting of bread and butter, a plate of well-cooked oatmeal with cream and plenty of milk, a soft-boiled egg, a mutton-chop, or a piece of steak finely minced. Avoid hot cakes, very fresh bread, or rich dishes of any sort. For the dinner, which should invariably be taken at an early hour, it is an important matter, when possible, to give fresh vegetables,—well-cooked potatoes and rice properly boiled,—and encourage the children to eat bread and butter with their meals. They should also have either cooked fruit or ripe raw fruits in abundance. The final meal should be a varied one; meat should be avoided; and it should consist of soft custards, milk-toast, or bread and butter made more inviting by a little good preserve. This outline will give an idea of the character of food that supplies brain, muscle, and nerve. It may be modified according to the peculiarities of the child, the time of year, and the family circumstances.

Do not let a mother suppose that because she has nursed her infant the usual time it cannot become rickety. Unless she lives upon food which will give to her milk in full proportion the quantities represented in the diet mentioned above, her child, though nursed and to all outward appearances subjected to only what is best for it, will in reality be no better off than a bottle-fed baby; indeed, a child carefully brought up on the bottle by an experienced person will be healthy in all respects.

We think that most mothers forget the important point that the nourishing quality of their milk depends on their own state of health.

As far as the medical treatment of rickets is concerned, we need only mention here those drugs which are in reality other forms of food. Cod-liver oil is pre-eminently the most important. It may have been ordered by the physician in early infant life, but if, at the period of childhood of which we are now

speaking, no physician is at hand, a mother should not hesitate to give it should the child complain of fatigue, grow thin, lose its appetite, or give other evidences of bad nutrition.

Before concluding this chapter it may be well to make a few remarks regarding the dress of young children. Habits of regularity should be instilled at a very early age, and may be so well established that by the second year the diaper can be exchanged for drawers. Should summer make it convenient to do so at an earlier period, it may be well to make the change, as in some children the thick folding of the diaper is apt to make them bow-legged, especially if it is not very carefully put on. This, of course, only refers to children who are walking. As regards the clothing of children in our damp seaboard climate, flannel should be insisted upon all the year round.

Teething children should wear fine merino stockings all the year. Two important things to bear in mind are the simplicity and loose fitting of all their clothing; the latter is most essential for growing children, as deformity, stooping shoulders, contracted chest, and weakened backs depend a great deal upon ill-fitting garments. Would that mothers were sufficiently impressed with this fact!

The next thing is the proper change of clothing to suit the seasons. Warm clothing is not necessarily cumbersome, and merino undershirts with high necks are certainly important, even in summer, though they be of the thinnest kind. Croup is, we think, not so prevalent as it used to be, and we can but attribute this to the much more common-sense way of clothing children than was fashionable some years ago; bare-necked, bare-armed, and bare-legged babies in midwinter are no longer seen,—those frail flowers of our hot winter houses, so often the victims of fatal draughts.

All children should wear thick-soled shoes, easy and well fitting, with room for growth at the toes; they should be without heels.

The importance of light calisthenics at this age cannot be

overestimated. Not only do they give, under competent management, a graceful and easy carriage, which means symmetrical development, but they supply muscular power, increase the force of the circulation, develop the chest and thereby the activity of the lungs, and give tone to the nervous system; in other words, they improve the digestion and the appetite, and in that way secure a flow of good, nourishing blood.

In conclusion, we will quote liberally from an excellent article that recently appeared in the *Spectator:*

"The world has grown unconsciously much wiser as to the management of children. Nothing improves physique like good milk,—that, and not porridge, is the cause of the tall Highlánders, Irishmen, and Sikhs,—and the little children of our day are nourished on cream-and-water, or milk procured from the great dairies, which is as good as milk can be, and as different from the milk of thirty years ago as Brand is different from old beef-tea. The very cows are of different breed, not to mention the improvement in their food and lodging. Then a prejudice of an extraordinarily injurious character—we write these sentences on first-class medical evidence—has silently, no one knows why, entirely disappeared. Nothing nourishes like good sugar, possessing as it does just the requisite heat-giving quality; but the mothers of 1830–50 dreaded sugar. They had an idea that it sickened babies, who always crave for it like horses for salt; that it spoilt the teeth of growing children; and that it swelled the tongues of children a little more advanced in years,—the last a fancy based on the effect of sucking toffy. They therefore withheld sugar, thus leaving the children half nourished, and permanently sensitive to a climate which for seven months in the year is always chilly. Nowadays, everybody among the cultivated knows that sugar is beneficial, and the children are left to their instincts, with the result that they make flesh, and are almost always warm. Then the matrons of 1830–50 had a fixed idea, incurable by the men, who never quite gave in to it, that children, if let alone, would invariably over-eat themselves, a

theory true of about five per cent. The nurseries were dieted like prisons, with the result—all nurses exaggerating the popular ideas—that the children who longed for food were never fed enough, and the children who disliked much food—a peculiarity of many good constitutions—were gorged to indigestion. And finally, children are kept warm enough. The horrible old idea of those two decades, that children should be 'hardened' by exposure, has died away; the nurseries, besides being properly ventilated, are kept warm, and the whole principle of children's clothing has been radically, and we hope finally, modified in the sense that the 'body,' as distinguished from the limbs, is thoroughly and warmly clad. The result is, that the child with a tendency to grow does grow, and that a greatly increased percentage of boys run towards five feet eleven inches, and of girls towards five feet eight inches, and five feet nine inches, than has ever been the case before. Moreover, as the boys and girls grow naturally, they keep their good looks, and, except for a year or two of life, it has become a positive rarity to see 'gawky' lads and lasses, as great a rarity as to see the latter with the shining red elbows which forty years ago were at once the most dreaded and the most frequent of the minor deformities. The improvement—always, mind, in a strictly limited class which hardly considers the cost of food—is manifest at every turn, and is reported not only by every artist, but every caricaturist in the country. The undersized lads and skinny girls have disappeared from pictures of the middle class, even when drawn with distinctly hostile intent.

"Food has been helped by training. It has become a custom to let girls live in the open air, to suffer them to play games which thirty years since would have been pronounced 'hoidenish,'—then a most opprobrious adjective,—and even to train them through gymnastics with scientific attention and regularity. They may take as much exercise as they like, and owing to the partly accidental introduction of vigorous games in which both sexes can share, they like to take a good deal.

'Ladies' cricket' and 'ladies' golf' are imitative tricks, with nothing to recommend them but the open air; but lawn tennis is sharp, healthy work, a great deal better than the hay-making of the last century, which overtaxed the spine; and so are riding, as now practised, and the walk of eight or ten miles, even if it ends in a rather fatiguing trudge. Exercise of that kind, while it makes the boys lissome, sets the girls up, a change which is no doubt one cause of their apparent increase in height. They stand on their feet and stand up as their grandmothers, with all their drilling on backboards and injunctions to sit straight up against chair-backs, which were tortures, never did. The girls stand like soldiers, without their stiffness; and because they can do it, and know they can, they fall instinctively into a style of dress which displays their ability, which recognizes, for example, the place of the waist in the human figure. Girls do not 'lollop' now, have, indeed, almost forgotten a word which forty years ago was incessantly in their seniors' mouths, and was the origin in thousands of cases of positive physical harm. A well-bred girl nowadays does not sit as if she were listening to a rebuke, and stiffening herself to disregard it; but she does not 'lollop,' any more than she ties her waist-belt about five inches too high."

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